Annual Ambient Air Monitoring Network Plan

2017

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

COMMONWEALTH OF VIRGINIA

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

AIR DIVISION – OFFICE OF AIR QUALITY MONITORING

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INTRODUCTION

40 CFR Part 58 Paragraph 10 states as follows:

§58.10 Annual monitoring network plan and periodic network assessment.
(a)(1) Beginning July 1, 2007, the state, or where applicable local, agency shall submit to the Regional Administrator an annual monitoring network plan which shall provide for the documentation of the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include FRM, FEM, and ARM monitors that are part of SLAMS, NCore, CSN, PAMS, and SPM stations. The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable. The Regional Administrator may require additional information in support of this statement. The annual monitoring network plan must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall include and address, as appropriate, any received comments.

This document is intended to address this regulatory requirement for an annual air monitoring network plan for the Commonwealth of Virginia. The requirements for the components of the annual monitoring network plan are contained in §58.10 paragraphs (2) through (13).

NETWORK DESIGN

The monitoring program for the Virginia Department of Environmental Quality operates the ambient air monitoring network of both gaseous and particulate pollutant monitors required in 42 US Code §7410 (a) (2) (B) (i) which requires that the Commonwealth of Virginia:

> ***(B)*** *provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to—*
> ***(i)*** *monitor, compile, and analyze data on ambient air quality,*

The implementation and operating requirements of the ambient monitoring network are contained in 40 CFR Part 58 as defined below in §58.2 as follows:

> *(1) Quality assurance procedures for monitor operation and data handling.*
> *(2) Methodology used in monitoring stations.*
> *(3) Operating schedule.*
> *(4) Siting parameters for instruments or instrument probes.*
> *(5) Minimum ambient air quality monitoring network requirements used to provide support to the State implementation plans (SIP), national air quality assessments, and policy decisions. These minimums are described as part of the network design requirements, including minimum numbers and placement of monitors of each type.*

Table 1 below shows the number of monitors and types of pollutants monitored and how they are distributed throughout the Commonwealth by Air Quality Control Region and Metropolitan Statistical Area. This table demonstrates air monitor distribution and pollutant measurement consistent with Part 58 Appendix D. In addition to the MSA/CBSA based pollutant monitoring, Virginia maintains additional monitoring sites to meet additional federal and state based monitoring programs. These programs are listed below.

Table 1 Air Monitoring Samplers/Analyzers in Virginia (collocated FRMs not included)

MSA/CBSA(a)	Pollutant Monitored						
	Ozone	PM2.5	NO2	SO2	CO	PM10	Lead (Pb)
Kingsport-Bristol-Bristol, TN-VA		1 FRM					
Winchester, VA-WV	1	1 FRM				1	
Harrisonburg, VA	1	1 FRM	1	1			
Roanoke, VA	1	2 FRM	1	2	1		1
Blacksburg-Christiansburg-Radford VA				1			
Lynchburg, VA		1 FRM					1
Charlottesville, VA	1	1 FRM 1 FEM					
Richmond, VA	5	5 FRM, 1 FEM	3	2	2	2	
Virginia Beach-Norfolk-Newport News, VA-NC	3	3 FRM, 1 FEM	2	2	2	2	
Washington-Arlington-Alexandria, DC-VA-MD-WV	6	3 FRM, 1 FEM	4	1	2	3	
Total – MSA/CBSA	18	22	11	9	7	8	2
Total- all sites(b)	21	22	11	10	7	9	2

(a) Metropolitan Statistical Areas/Core based statistical areas

(b) Includes sites not incorporated into an MSA or CBSA i.e. Shenandoah National Park, Rockbridge County, Carroll County, Wythe County, City of Covington.

Urban Air Toxics Programs – The Department of Environmental Quality maintains two urban air toxics sites at: 51-670-0010 Hopewell City Woodson Middle School, and 51-810-0008 Virginia Beach City Virginia Beach DEQ Tidewater Regional Office. The urban air toxics site, 51-059-0030 Fairfax County Lee District Park, was shut down effective April 1, 2017.

NCore, the National Core Monitoring Network – The NCore site maintained by DEQ is located at 51-087-0014 Henrico County MathScience Innovation Center (MSIC). The Design Criteria for the NCore site in Virginia is defined in Appendix D of Part 58 of 40 CFR.

National Air Toxics Trend Site – DEQ maintains a NATTS site located at 51-087-0014 Henrico County MSIC site. In addition to the suite of pollutants measured in the Urban Air Toxics Program, NATTS also monitors for Polycyclic Aromatic Hydrocarbons.

Near Road Monitoring – DEQ will install three near road monitoring sites consistent with the design requirements contained in Appendix D. DEQ currently has two operating sites located at 51-760-0025 Richmond City Joseph Bryan Park and 51-059-0031 located in Springfield at the Backlick Road park and ride. The third site will be located in the Virginia Beach-Norfolk-Newport News VA-NC is described in the Virginia Network Changes section.

ACRONYM LISTING

ARM	Approved Regional Method
AQCR	Air Quality Control Region (see 9 VAC 5-20-200)
CAA	Clean Air Act
CBSA	Core Based Statistical Area
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CSN	Chemical Speciation Network
ES	Elementary School
FEM	Federal Equivalent Method
FRM	Federal Reference Method
MSA	Metropolitan Statistical Area
NATTS	National Air Toxics Trend Site
NCore	National Core Monitoring Site
NO2	Nitrogen Dioxide
PAMS	Photochemical Assessment Monitoring
Pb	Chemical Symbol for metallic Lead
PM2.5	Particulate Matter less than 2.5 microns in diameter
PM10	Particulate Matter less than 10 microns in diameter
SLAMS	State/Local Air Monitoring Site
SO2	Sulfur Dioxide
SO2 DRR	Sulfur Dioxide Data Requirements Rule
TEOM	Tapered Element Oscillating Microbalance PM2.5 monitoring technology

AIR QUALITY MONITORING NETWORK CHANGES

MONITORING SITE CHANGES SINCE LAST REVIEW
JULY 1, 2016 to JUNE 30, 2017

51-059-0030, 46-B9, Lee District Park Urban Air Toxics Site, Fairfax County, AQCR7

The Urban Air Toxics suite of pollutants was shut down and removed from the Lee District Park air monitoring site effective April 1, 2017. The toxics suite of pollutants was removed from this site due to financial constraints on the Office of Air Quality Monitoring analytical budget. The site was installed in 2000 and was originally placed at this location to meet the Clean Air Act requirements for the monitoring of air toxic pollutants in urban environments. The CAA requirement for toxics monitoring in the Washington Metropolitan Statistical Area will now be fully met by the NATTS site at the McMillan Reservoir (AQS 11-001-0043). The Lee District Park site continues to monitor for Ozone, Sulfur Dioxide, PM2.5, and PM10.

Figure 1 – Lee District Park Air Monitoring Site

51-023-0004, 20-E, Roanoke Cement SO2 Monitoring Site, Roanoke County, AQCR3

Beginning January 1, 2017 those facilities that chose to demonstrate compliance with the SO2 Data Requirements Rule by installing an SO2 ambient air monitoring system were required to begin operating their monitoring sites. One of the facilities within the Commonwealth of Virginia that selected the monitoring option was Roanoke Cement (Federal ID VA0000005102300003) located in Botetourt County in the town of Troutville. The Roanoke Cement site began operation January 1, 2017 and is currently operating consistently with the requirements of the SO2 Data Requirements Rule. Figure 1 below provides a view of the monitoring site and Figure 2 provides the view from the monitoring site in all the cardinal directions.

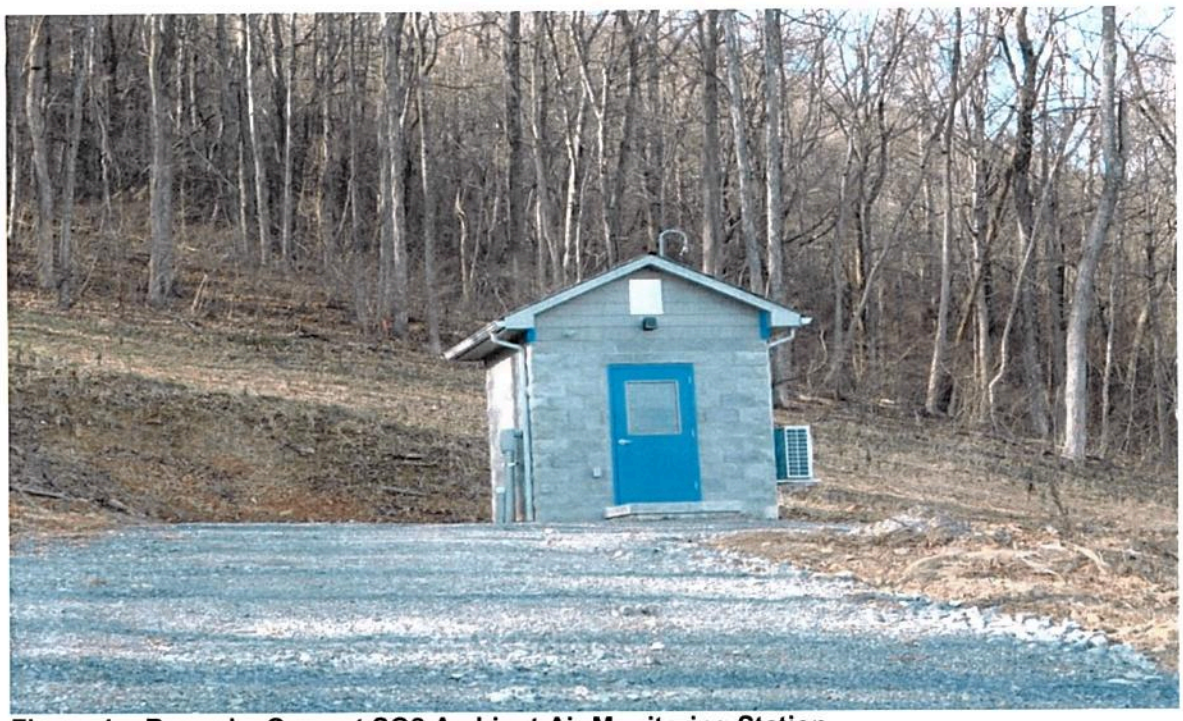


Figure 1 – Roanoke Cement SO2 Ambient Air Monitoring Station

View from Monitoring Site North

View from Monitoring Site East

View From Monitoring Site South

View from Monitoring Site West

Figure 2 Views from Roanoke Cement Monitoring Site

51-071-0007, 9-I, Lhoist North America SO2 Monitoring Site, Giles County, AQCR3

Beginning January 1, 2017 those facilities that chose to demonstrate compliance with the SO2 Data Requirements Rule by installing an SO2 ambient air monitoring system were required to begin operating their monitoring sites. One of the facilities within the Commonwealth of Virginia that selected the monitoring option was Lhoist North America (Federal ID VA000000510710001) located in Giles County in the unincorporated community of Ripplemead. The Lhoist air monitoring site began operation January 1, 2017 and is currently operating consistently with the requirements of the SO2 Data Requirements Rule. Figure 3 below provides a view of the monitoring site and Figure 4 provides the view from the monitoring site in all the cardinal directions.

Figure 3 – Lhoist SO2 Ambient Air Monitoring Station

51-580-0008, 104-M, WestRock Covington SO2 Monitoring Site, Covington City, AQCR3

Beginning January 1, 2017 those facilities that chose to demonstrate compliance with the SO2 Data Requirements Rule by installing an SO2 ambient air monitoring system were required to begin operating their monitoring sites. One of the facilities within the Commonwealth of Virginia that selected the monitoring option was WestRock Covington Mill (Federal ID VA0000005180000003) located in the City of Covington in Allegheny County. The WestRock air monitoring site began operation in January 2017 and is currently operating consistently with the requirements of the SO2 Data Requirements Rule. Figure 5 below provides a view of the monitoring site and Figure 6 provides the view from the monitoring site in all the cardinal directions.

View from Monitoring Site North

View from Monitoring Site East

View From Monitoring Site South

View from Monitoring Site West

Figure 4 Views from Lhoist Monitoring Site

Figure 5 – WestRock SO2 Ambient Air Monitoring Station

View from Monitoring Site North

View from Monitoring Site East

View From Monitoring Site South

View from Monitoring Site West

Figure 6 Views from WestRock Monitoring Site

51-179-0001, 44-A, Widewater Elementary School, Stafford County, AQCR7

The Stafford County Ozone monitoring site at the Widewater Elementary School was completely refurbished. The work began in December 2016 and continued through February 2017. The completed station was started back up and operating in time for the start of the Ozone season on March 1, 2017. Several changes were made to the station; 1. The old wooden shelter was removed and demolished. The shelter had been in use since 1991 and had become mold infested; 2. The PM10 monitor located at Hugh Mercer Elementary School in Fredericksburg City (AQS No. 51-630-0004) was relocated to the Widewater site, the start-up date was March 8, 2017; 3. The fenceline was expanded to accommodate the additional monitor; and 4) electrical systems were upgraded to improve reliability and modernize the electrical infrastructure. Figure 7 below displays a current picture of the new monitoring site. The PM10 Monitor is located to the right of the station entrance.

INSTRUMENT CHANGES SINCE LAST REVIEW
JULY 1, 2016 through JUNE 30, 2017

51-650-0008, 179-K, NASA Langley Research Center, City of Hampton, AQCR6

Due to the age of the TEOM instruments currently deployed at DEQ stations throughout the Commonwealth, the Office of Air Quality Monitoring is systematically replacing the existing TEOM instruments with alternative continuous PM2.5 instruments. As part of this effort the TEOM continuous PM2.5 monitor at NASA Langley was replaced with a Thermo 5014i in March, 2017.

Figure 7 Refurbished Monitoring Site in Stafford County (AQS No. 51-179-0001)

51-630-0004, 130-D, Hugh Mercer Elementary School, City of Fredericksburg, AQCR7

Per the discussion above in the Widewater ES Monitoring station write-up, the PM10 monitor at Hugh Mercer ES was shut down effective March 9, 2017.

51-003-0001, 33-A, Albemarle HS TEOM PM2.5 Monitor, Albemarle County, AQCR4

At the Albemarle Monitoring site the current TEOM continuous PM2.5 Monitor was changed out and replaced with a Themo 5014i FEM continuous PM2.5 monitor. This site also has a collocated sequential PM2.5 FRM sampler. The continuous FEM and the FRM samplers will be run as collocated monitors for one full operating year so that the data can be compared to ensure good correlation between the FEM monitor which uses the Beta Attenuation technology and the filter based FRM monitor.

51-041-0004, 71-H, Beach Road VDOT Ozone, Chesterfield County, AQCR5

As part of evaluating alternate locations for the PM2.5 FRM monitor at the Bensley Armory (51-041-0003), a PM2.5 FRM monitor was placed at the Beach Road Ozone site to evaluate the data obtained from both locations and compare results. The Beach road location was the closest alternate location that already had an existing DEQ monitoring presence. The monitor was placed on site in August of 2016 and both sites were operated through December 2016 to allow for comparison of the data. The comparison indicated no statistically significant difference between the PM2.5 data from both sites.

51-041-0003, 71-D, Bensley Armory PM2.5 FRM, Chesterfield County, AQCR5

The current Bensley Armory site access has become problematic; the monitor is located on the property of the U. S. Defense Supply Center in southeast Chesterfield County. The level of security needed to enter the property has steadily increased consistent with the level of awareness and attention to security matters generally. This has created significant delays and persistent difficulty in accessing the monitor to perform even routine and consistent tasks needed to ensure the monitor will run properly with the appropriate level of data capture. To address this need, AQM will relocate the PM2.5 FRM monitor currently located at the Bensley Armory to the Beach Road site (51-041-0004) also located in Chesterfield County, a site that is less than 10 miles from the current Bensley Armory and has the same designated monitoring objective and spatial scale. The Bensley Armory PM2.5 FRM was shutdown December 31, 2016.

51-710-0024, 181-A, NOAA Storage Facility PM2.5, Norfolk City, AQCR6

The NOAA facility had collocated PM2.5 FRM monitors. As part of the Appendix A changes finalized on April 27, 2016, AQM reviewed the design value data for all PM2.5 FRM sites throughout the Commonwealth. AQM relocated the existing collocated PM2.5 monitor from the existing NOAA Storage Facility site to the monitoring site located in Frederick County (EPA ID 51-069-0010). This change was made to address 40 CFR 58 Appendix A paragraph 3.2.3.4 (b) which states "If an organization has no sites with annual average or daily concentrations within ±20 percent of the annual NAAQS or 24-hour NAAQS, 50 percent of the collocated quality control monitors should be deployed at those sites with the annual mean concentrations or 24-hour concentrations among the highest for all sites in the network and the remainder at the PQAOs discretion." The NOAA Collocated PM2.5 monitor was relocated effective July 1, 2016.

51-069-0010, 28-J, Public Schools Maintenance Division PM2.5, Frederick County, AQCR2

Per the discussion regarding the above relocation, the collocated monitor originally located at the NOAA site in Norfolk, Virginia was relocated to the Frederick County site. Table 1 below provides the Design Value analysis that supported the Relocation:

Table 1 Design Value analysis, PM2.5 relocation of Collocated site

PM2.5 FRM Design Value, 24-hr, 2013 - 2015			PM2.5 Annual Design Value, 2013 - 2015		
Site	AQS Number	DV, µg/m3	Site	AQS Number	DV, µg/m3
Frederick	510690010	24	Frederick	510690010	9.0
Rockingham	511650003	22	Arlington	510130020	8.9
Arlington	510130020	20	Loudoun	511071005	8.7
Loudoun	511071005	20	Salem	517750011	8.5
Fairfax	510590030	20	Rockingham	511650003	8.5
VA Beach	518100008	19	Chesterfield	510410003	8.3
Salem	517750011	18	Fairfax	510590030	8.2
Roanoke Co.	511611004	18	Bristol	515200006	8.2
Chesterfield	510410003	18	Roanoke Co.	511611004	8.1
Henrico (MSIC)	510870014	17	Henrico (MSIC)	510870014	8.0
Albemarle	510330001	17	Henrico (PRO)	510870015	7.9
Charles City	510360002	17	VA Beach	518100008	7.9
Henrico (PRO)	510870015	17	Norfolk	517100024	7.7
Lynchburg	516800015	17	Charles City	510360002	7.7
Norfolk	517100024	16			
Frederick	510690010	24			

ANTICIPATED SITE CHANGES
JULY 1, 2017 through JUNE 30, 2018

51-650-XXXX Hampton Roads Near Road Site, Along I-64, Hampton Beach, AQCR6

Multiple efforts have been made to locate the Hampton Roads Near road site in the first or second highest Fleet Adjusted AADT road segment. Table 1 below documents the road segments, potential siting and the result of the approval process.

Table 1 Near Road site location attempts

Road Segment	Fleet Adj.- AADT	Location of Site	Results of Approval Process
I-264 EB – I-64 to WCL VA Beach	132939	36° 51.185' N; -76° 11.706' W	City would not approve site due to proximity to underground water line
1-264 EB – SR 190 to SR225	125120	36° 50.05833' N; 76° 8.5633' W	Easement Owned by contiguous Apartment developer would not allow construction
1-264 EB – SR 190 to SR225	125120	36.836963° N; -76.157183° W	Site located on newly sold Easement intended for VDOT road widening
1-264 EB – SR 190 to SR225	125120	36.843942° N; -76.169970° W	Exit from I-264 to be extended site is part of VDOT I-264 upgrade

The four sites above were found unsuitable for the near road site for the reasons given above.

To address the commitment to install a near road site in the Hampton Roads area, AQM reviewed the 2015 AADT information and located a site that is along the fifth highest Fleet adjusted Near Road monitoring site located along I-64 westbound in Hampton. Figure 8 below provides an aerial view of the siting area and the potential monitoring site location.

Figure 8 - Proposed Near Road Site Hampton VA, Interstate I-64

The road segment is located between the Mercury Blvd on-ramp and Magruder Blvd. The road segment information is provided in Table 2 below:

Table 2 – Road Segment information for Potential Near Road Site in Hampton

Route		dist	Start Label	End Label	Fleet adj. AADT
I-64	W	0.79	SR 134 Magruder Blvd	US 258, SR 134 Mercury Blvd	114323

Discussions with the City of Hampton have just started on this property. AQM has provided a project narrative and examples from the other sites in Virginia.

51-009-0007, 53-G, Madison Heights Source-specific Lead Monitor, Amherst County, AQCR3

On June 30, 2016 Virginia DEQ received approval of a Lead monitoring waiver request for the Madison Heights site located in Amherst County. The request for the monitoring waiver was granted based on the most recent design value calculation for this site. The site is currently still operating until the Radford Lead Site is installed. The Madison Heights site is being maintained due to the existence of the Collocated monitor at this site.

Figure 9 - Madison Heights Lead Monitoring Site, Amherst County

51-121-XXXX, Radford Army Arsenal Plant Pb-TSP monitor, Radford City, AQCR2

The 2008 revised Lead NAAQS standard was reviewed and retained in 2015. As a result of the review of Lead sources in Virginia associated with the proposed retention of the standard it was determined that the emissions levels at the Radford Army Arsenal Plant (Federal ID in Radford, VA met the applicability threshold. As a result of this determination, VA DEQ has begun the process of installing a site specific lead monitoring site near the plant. A location has been selected at the Stroubles Creek Waste Water Treatment Plant property and approval from the facility has been received. The spatial scale will be middle scale consistent with 40 CFR Part 58 Appendix D, paragraph 4.5(d). This site will also be installed with a collocated Lead-TSP monitor. The projected operational date is August 1, 2017.

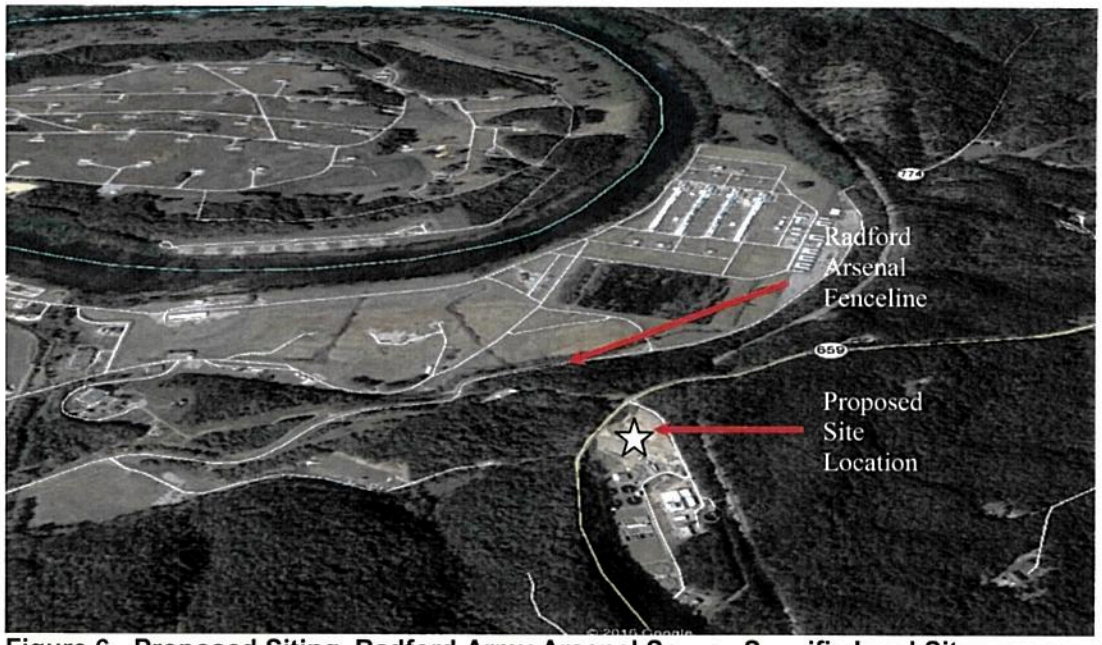


Figure 6 - Proposed Siting, Radford Army Arsenal Source Specific Lead Site

ANTICIPATED INSTRUMENTATION CHANGES
JULY 1, 2017 through JUNE 30, 2018

51-087-0014, 72-M, MathScience Innovation Center Continuous PM2.5, Henrico County, AQCR5

Due to the age of the TEOM instruments currently deployed at DEQ stations throughout the Commonwealth, the Office of Air Quality Monitoring is systematically replacing the existing TEOM instruments with alternative continuous PM2.5 instruments. As part of this effort the TEOM continuous PM2.5 monitor at the MSIC site will be replaced with a Teledyne T-640 continuous PM2.5 monitor (FEM designation EQPM-0516-238). The site already has an FRM PM2.5 monitor in place so the requirement for collocation will be met upon installation. The DEQ continuous PM2.5 fleet as currently deployed is listed in table 3 below.

Table 3 Continuous PM2.5 monitors currently deployed

AQS Number	Station Location	Instrumentation
51-069-0010	Frederick County	TEOM
51-003-0001	Albemarle County	Thermo 5014i (collocated FRM)
51-161-1004	Roanoke County	TEOM
51-087-0014	Henrico County	TEOM
51-760-0025	Richmond near road site	Thermo 5014i (collocated FRM)
51-650-0008	Hampton City	Thermo 5014i (collocated FRM)
51-059-0030	Fairfax County	TEOM
51-059-0031	Fairfax near road site	Thermo 5014i

Attachment 1
Virginia Site Listing

Virginia Monitoring Network Minimum Monitoring requirements

Ozone Monitors - Per 40 CFR 58.10(a)(9) all ozone monitors were in operation by March 1, 2017.

MSA	Population	Required Monitors	Operating monitors	Sites
Washington-Arlington-Alexandria, DC-VA-MD-WV	5,582,170	3	51-061-0002	Fauquier County
			51-179-0001	Stafford County
			51-013-0020	Arlington County
			51-059-0030	Fairfax County
			51-107-1005	Loudon County
			51-153-0009	Prince William Co.
Virginia Beach-Norfolk-Newport News, VA-NC	1,671,683	2	51-650-0008	Hampton City
			51-800-0004	Suffolk City
			51-800-0005	Suffolk City
Richmond, VA	1,258,251	2	51-033-0001	Caroline County
			51-036-0002	Charles City County
			51-041-0004	Chesterfield County
			51-085-0003	Hanover County
			51-087-0014	Henrico County
Roanoke, VA	308,707	1	51-161-1004	Roanoke County

Attachment 1 (cont.)
Virginia Site Listing

Virginia Monitoring Network Minimum Monitoring requirements (continued)

PM2.5 Monitors

MSA	Population	Required Monitors	Operating monitors	Sites
Washington-Arlington-Alexandria, DC-VA-MD-WV	5,582,170	2	51-107-1005	Loudon County
			51-013-0020	Arlington County
			51-059-0030	Fairfax County
			51-059-0031	Fairfax County
			51-107-1005	Loudon County
Virginia Beach-Norfolk-Newport News, VA-NC	1,671,683	2	51-650-0008	Hampton City
			51-710-0024	Norfolk City
Richmond, VA	1,258,251	2	51-760-0025	Richmond City
			51-036-0002	Charles City County
			51-041-0003	Chesterfield County
			51-087-0015	Henrico County
			51-087-0014	Henrico County
Roanoke, VA	308,707	0	51-161-1004	Roanoke County

VA DEQ, AQCR I SOUTHWEST VIRGINIA, July 1, 2017

SITE I.D.	POLLUTANT MEASURED	METHOD OR INSTRUMENT	SAMPLING INTERVAL	MONITORING OBJECTIVE	SCALE	BEGINNING DATE	MONITOR NETWORK	MONITOR TYPE	LOCATION	LONGITUDE	LATITUDE
51-035-0001 (23-A)	PM-10 (81102)	SSI HI VOL	1/6	Population	Neighborhood	5/28/89		SLAMS	Carroll Co. - Gladeville Elem. School	-80.8798	36.7007
51-197-0002 (16-B)	O3 (44201)	UV Absorption	Continuous	Population	Regional	4/1/90		SLAMS	Rural Retreat - Wythe County Sewage Treatment Plant	-81.2542	36.8912
51-520-0006 (101-E)	PM2.5 FRM* (88101)	Sequential	1/3	Population	Neighborhood	1/1/99		SLAMS	Bristol - Highland View Elem. Sch.	-82.1641	36.6080

There are no collocated monitors in AQCR I

* **Per 58.10(b)(7) this site is suitable for comparison with the NAAQS as described in 40 CFR §58.30.**

VA DEQ, AQCR II VALLEY OF VIRGINIA, July 1, 2017

SITE I.D.	POLLUTANT MEASURED	METHOD OR INSTRUMENT	SAMPLING INTERVAL	MONITORING OBJECTIVE	SCALE	BEGINNING DATE	MONITOR NETWORK	MONITOR TYPE	LOCATION	LONGITUDE	LATITUDE	CBSAs/ MSAs	
51-069-0010 (28-J)	O3(44201) PM2.5 FRM* (88101) PM2.5 (88501)	UV Absorption Sequential TEOM	Continuous 1/3 Continuous	Population Population Background	Urban Urban Urban	4/1/91 1/1/08 1/1/08		SLAMS SLAMS OTHER	Rest, Frederick County - Lester Buildings	-78.0816	39.2810	49020/	Winchester, VA-WV
51-840-0002 (134-C)	PM-10 (81102)	SSI HI VOL	1/6	Population	Neighborhood	9/13/89		SLAMS	Winchester - Courts Bldg.	-78.1631	39.1840	49020/	Winchester, VA-WV
51-161-1004 (19-A6)	NO2 (42602) O3(44201) SO2 (42401) CO (42101) PM2.5 FRM* (88101) PM2.5 (88501)	Chemiluminescence UV Absorption Fluorescence Gas Filter Corr. Sequential TEOM	Continuous Continuous Continuous Continuous Daily Continuous	Population Population Population Population Population Background	Neighborhood Neighborhood Neighborhood Neighborhood Neighborhood Neighborhood	1/1/81 8/81 1/29/87 4/04 4/1/08 4/1/08		SLAMS SLAMS SLAMS SLAMS SLAMS OTHER	Vinton - Roanoke Co. Herman Horn ES	-79.8845	37.2834	40220/	Roanoke, VA
51-163-0003 (21-C)	O3(44201) PM2.5 (88502)	UV Absorption IMPROVE	Continuous Continuous	Background Background	Regional Regional	4/8/99	IMPROVE	SLAMS	Rockbridge Co. - Natural Bridge Station	-79.5126	37.6267	None	
51-165-0003 (26-F)	SO2 (42401) NO2 (42602) PM2.5 FRM* (88101) O3(44201)	Fluorescence Chemiluminescence Sequential UV Absorption	Continuous Continuous 1/3 Continuous	Population Population Population Population	Neighborhood Neighborhood Neighborhood Neighborhood	9/22/97 4/04 1/1/07 4/1/07		SLAMS SLAMS SLAMS SLAMS	Rockingham Co. - VDOT	-78.8195	38.4775	25500/	Harrisonburg, VA
51-775-0011 (110-C)	PM2.5 FRM* (88101)	Sequential	1/3	Population	Neighborhood	9/8/09		SLAMS	Salem - Salem High School	-80.0810	37.2979	40220/	Roanoke, VA
51-770-0011 (109-N)	TSP-Lead (14129)	Tisch Hi-Vol TSP Sampler	1/6	Source Oriented	Neighborhood	11/1/14		SLAMS	Roanoke City Mario Industries 2502 Patterson Ave. SW	-79.9857	37.2749	40220/	Roanoke, VA
51-023-0004 (20-E)	SO2 (42401)	Fluorescence	Continuous	Highest Concentration	Source Oriented	1/1/17		SLAMS - Like	Botetourt County Roanoke Cement 6071 Catawba Road	-79.98649	37.44796	40220/	Roanoke, VA
51-071-0004 (9-I)	SO2 (42401)	Fluorescence	Continuous	Highest Concentration	Source Oriented	1/1/17		SLAMS - Like	Giles County Lhoist North America 2093 Big Stony Creek Rd	-80.65362	37.3869	13980/	Blacksburg-Christiansburg-Radford, VA
51-580-0008 (104-M)	SO2 (42401)	Fluorescence	Continuous	Highest Concentration	Source Oriented	1/1/17		SLAMS - Like	Covington City WestRock, Inc. 104 west Riverside St.	-79.9763	37.79435	None	

There is one collocated monitors in AQCR II. A collocated PM2.5 is located at 51-069-0010, Frederick County.

* **Per 58.10(b)(7) this site is suitable for comparison with the NAAQS as described in 40 CFR §58.30.**

VA DEQ, AQCR III CENTRAL VIRGINIA, July 1, 2017

SITE I.D.	POLLUTANT MEASURED	METHOD OR INSTRUMENT	SAMPLING INTERVAL	MONITORING OBJECTIVE	SCALE	BEGINNING DATE	MONITOR NETWORK	MONITOR TYPE	LOCATION	LONGITUDE	LATITUDE	CBSAs/ MSAs	
51-680-0015 (155-Q)	PM2.5 FRM* (88101)	Sequential	1/3	Population	Neighborhood	4/1/03		SLAMS	Lynchburg - Water Tank	-79.2150	37.3327	31340/	Lynchburg, VA
51-009-007 (53-G)	TSP-Lead (14129)	Tisch Hi-Vol TSP Sampler	1/6	Source Oriented	Neighborhood	11/1/10		SLAMS	CVTC, Madisor Heights Amherst Co.	-79.1162	37.4122	31340/	Lynchburg, VA

There is one collocated monitor in AQCR3. A collocated Hi-Vol TSP-lead monitor is located at 53-G Madison Heights and is designated H-53-G.

* **Per 58.10(b)(7) this site is suitable for comparison with the NAAQS as described in 40 CFR §58.30.**

VA DEQ, AQCR IV NORTHEAST VIRGINIA, July 1, 2017

SITE I.D.	POLLUTANT MEASURED	METHOD OR INSTRUMENT	SAMPLING INTERVAL	MONITORING OBJECTIVE	SCALE	BEGINNING DATE	MONITOR NETWORK	MONITOR TYPE	LOCATION	LONGITUDE	LATITUDE	CBSAs/ MSAs	
51-033-0001 (48-A)	O3(44201) Meteorological Instrumentation	UV Absorption Wind Speed, Humidity Temp., Wind direction Barometric Pressure	Continuous Continuous	Background Population	Regional Neighborhood	4/1/93 6/1/02		SLAMS SPECIAL PURPOSE	Caroline Co. - USGS Geomagnetic Center	-77.3774	38.2009	40060/	Richmond, VA
51-061-0002 (37-B)	O3(44201)	UV Absorption	Continuous	Background	Regional	9/1/81		SLAMS	Fauquier Co. - Phelps Wildlife Area	-77.7677	38.4737	47900/	Washington-Arlington-Alexandria, DC-VA-MD-W
51-179-0001 (44-A)	O3(44201) PM-10 (81102)	UV Absorption SSI HI VOL	Continuous 1/6	Population Population	Neighborhood Neighborhood	9/1/92 3/1/17		SLAMS	Stafford Co. - Widewater	-77.3704	38.4812	47900/	Washington-Arlington-Alexandria, DC-VA-MD-W
51-113-0003 (N-35-A)	O3(44201) PM2.5 (88502) PM2.5 (88501)	UV Absorption IMPROVE TEOM	Continuous 1/3 Continuous	Population Background Background	Regional Regional Regional	 5/04	CASTNET IMPROVE	EPA OTHER	Madison County - Shenandoah Nat'l Park Big Meadows	-78.4347	38.5231	None	
51-003-0001 33-A	O3(44201) PM2.5 FRM* (88101) PM2.5 (88501)	UV Absorption Sequential Beta Attenuation	Continuous 1/3 Continuous	Population Population Background	Regional Neighborhood Neighborhood	4/1/08 4/1/08 4/1/08		SLAMS SLAMS SLAMS	Albemarle Co. - Albemarle High School	- 78.5040	38.0766	16820/	Charlottesville, VA

There are no collocated monitors in AQCR IV

* Per 58.10(b)(7) this site is suitable for comparison with the NAAQS as described in 40 CFR §58.30.

VA DEQ, AQCR V STATE CAPITOL, July 1, 2017

SITE I.D. SITE I.D.	POLLUTANT MEASURED	METHOD OR INSTRUMENT	SAMPLING INTERVAL	MONITORING OBJECTIVE	SCALE	BEGINNING DATE	MONITOR NETWORK	MONITOR TYPE	LOCATION	LONGITUDE	LATITUDE	CBSAs/ MSAs	
51-036-0002	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	3/29/88		SLAMS	Charles City Co. -	-77.2593	37.3444	40060/	Richmond, VA
(75-B)	SO2 (42401)	Pulsed Fluorescence	Continuous	Highest Concentration	Neighborhood	1/1/92		SLAMS	Route #608 Shirley Plantation				
	NO2 (42602)	Chemiluminescence	Continuous	Population	Neighborhood	3/9/93		SLAMS					
	PM2.5 FRM* (88101	Sequential	1/3	Population	Neighborhood	1/1/99		SLAMS					
51-041-0004	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	4/80		SLAMS	Chesterfield Co. -	-77.5936	37.3575	40060/	Richmond, VA
(71-H)	PM2.5 FRM* (88101	Sequential	1/3	Population	Neighborhood	1/1/17			Beach Rd. VDOT				
51-085-0003	O3(44201)	UV Absorption	Continuous	Highest Concentration	Urban	4/1/01		SLAMS	Hanover Co. - McClellan Road	-77.2188	37.6061	40060/	Richmond, VA
(73-E)													
51-087-0014	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	6/12/81		SLAMS	Henrico Co. -	-77.4003	37.5565	40060/	Richmond, VA
(72-M)	Trace CO (42101)	Gas Filter Correlation	Continuous	Population	Neighborhood	4/1/81	Ncore	SLAMS	MathScience Center				
	Trace SO2 (42401)	Pulsed Fluorescence	Continuous	Population	Neighborhood	8/29/13	Ncore	SLAMS					
	PM2.5 FRM* (88101	Sequential	Daily	Population	Neighborhood	1/1/99		SLAMS					
	PM2.5 (88501)	Beta Attentuation	Continuous	Population	Neighborhood	7/18/00		SLAMS					
	PM2.5 (88502)	Speciation	1/3 Mini-Trends	Population	Neighborhood	1/1/04	CSN	EPA					
	PM2.5	Carbon	1/3 Mini-Trends	Population	Neighborhood	1/1/10	CSN	EPA					
	PM-10 (81102)	SSI HI VOL	1/6	Population	Neighborhood	11/1/08		SLAMS					
	PM10-2.5 (86101)	Sequential	1/3	Population	Neighborhood	10/8/09	NCore						
	Metals	PM-10 HI VOL	1/6	Background	Neighborhood	11/1/08	NATTS						
	Carbonyl	TO-11A	1/6	Background	Neighborhood	11/1/08	NATTS						
	VOCs	TO-15	1/6	Background	Neighborhood	11/1/08	NATTS						
	PAH	TSP	1/6	Background	Neighborhood	11/1/08	NATTS						
	Noy (42600)	Chemiluminescence	Continuous	Population Vulnerable and Susceptible	Neighborhood	5/1/05	NCore						
	NO2 Trace (42602)	Chemiluminescence	Continuous	Population	Neighborhood	5/1/05	Ncore						
	Meteorological Instrumentation	Wind Speed, Humidity Temp., Wind direction Barometric Pressure	Continuous	Population	Neighborhood	7/1/10	NCore						
	VOC - PAMS	Automated GC	Continuous	Background	Regional	5/1/13	PAMS						
	VOC - PAMS episodic	TO-12	eight 3 hr. canisters	Background	Regional	5/1/13	PAMS						
51-087-0015	PM2.5 FRM* (88101	Sequential	1/3	Population	Neighborhood	1/1/99		SLAMS	Henrico Co. -	-77.5666	37.6712	40060/	Richmond, VA
(72-N)									Piedmont DEQ				
51-670-0010	PM-10 (81102)	PM10 SSI HI VOL	1/6	Population	Neighborhood	11/1/08		SLAMS	Hopewell -	-77.2918	37.2896	40060/	Richmond, VA
(154-M)	Metals	TSP/ICPMS	1/6	Population	Neighborhood	11/1/08		UATM	Carter G. Woodson				
	VOCs	TO-15	1/6	Population	Neighborhood	11/1/08		UATM	Middle School				
	Carbonyl	TO-11	1/6	Population	Neighborhood	11/1/08		UATM					
51-760-0025	NO2 (42602)	Chemiluminescence	Continuous	Near Road	Microscale	10/1/13	NEAR ROAD	SLAMS	City of Richmond -	77.4692	37.5911	40060/	Richmond, VA
(158-X)	CO (42101)	Gas Filter Correlation	Continuous	Near Road	Microscale	10/1/13	NEAR ROAD	SLAMS	Joseph Bryan Park				
	PM2.5 FEM (88101)	Beta Attenuation	Continuous	Near Road	Microscale	10/1/14	NEAR ROAD	Special Purpose					

There are 3 collocated monitors in AQCR V. At Station 72-M, 510870014 - collocated PM2.5 FRM and Collocated Hi Vol PM10; Station 154-M Collocated VOC sampler

* Per 58.10(b)(7) this site is suitable for comparison with the NAAQS as described in 40 CFR §58.30.

VA DEQ, AQCR VI HAMPTON ROADS, July 1, 2017

SITE I.D.	POLLUTANT MEASURED	METHOD OR INSTRUMENT	SAMPLING INTERVAL	MONITORING OBJECTIVE	SCALE	BEGINNING DATE	MONITOR NETWORK	MONITOR TYPE	LOCATION	LONGITUDE	LATITUDE	CBSAs/ MSAs	
51-650-0008	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	7/1/10		SLAMS	Hampton City -	-76.3870	37.1037	47260/	Virginia Beach-Norfolk-Newport News, VA-I
(179-K)	SO2 (42401)	Fluorescence	Continuous	Population	Neighborhood	7/1/10		SLAMS	NASA Langley				
	NO2 (42602)	Chemiluminescence	Continuous	Population	Neighborhood	7/1/10		SLAMS	CAPABLE Site				
	CO (42101)	Gas Filter Corr.	Continuous	Population	Neighborhood	7/1/10		SLAMS					
	PM2.5 FRM* (88101	Sequential	1/3	Population	Neighborhood	7/1/10		SLAMS					
	PM2.5 (88501)	Beta Attenuation	Continuous	Population	Neighborhood	7/1/10		SLAMS					
	PM10 (81102)	SSI HI VOL	1/6	Population	Neighborhood	7/1/10		SLAMS					
51-710-0024	SO2 (42401)	Pulsed Fluorescence	Continuous	Population	Neighborhood	1/7/10		SLAMS	Norfolk City -	-76.3014	36.8556	47260/	Virginia Beach-Norfolk-Newport News, VA-I
(181-A1)	NO2 (42602)	Chemiluminescence	Continuous	Population	Neighborhood	1/7/10		SLAMS	NOAA Storage				
	CO (42101)	Gas Filter Corr.	Continuous	Population	Neighborhood	12/22/09		SLAMS	Facility				
	PM10 (81102)	SSI HI VOL	1/6	Population	Neighborhood	6/21/97		SLAMS					
	PM2.5 FRM* (88101	Sequential	1/3	Population	Neighborhood	1/1/99		SLAMS					
51-800-0004 (183-E)	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	4/1/87		SLAMS	Suffolk City - Tidewater Community College	-76.4381	36.9012	47260/	Virginia Beach-Norfolk-Newport News, VA-I
51-800-0005 (183-F)	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	4/1/91		SLAMS	Suffolk City - Tidewater Research Station, Holland	-76.7304	36.6653	47260/	Virginia Beach-Norfolk-Newport News, VA-I
51-810-0008	PM2.5 FRM* (88101	Sequential	Daily	Population	Neighborhood	1/1/99		SLAMS	VA Beach City -	-76.1812	36.8419	47260/	Virginia Beach-Norfolk-Newport News, VA-I
(184-J)	VOC	TO-15	1/6	Background	Neighborhood	7/1/05		UATM	VA Beach DEQ Office				
	Carbonyl	TO-11A	1/6	Background	Neighborhood	7/1/05		UATM					
	Metals	TSP	1/6	Background	Neighborhood	8/2/05		UATM					

There is one collocated monitor in AQCR VI. Collocated PM10 at 181-A1, 517100024, the NOAA Storage Facility in Norfolk.

* Per 58.10(b)(7) this site is suitable for comparison with the NAAQS as described in 40 CFR §58.30.

VA DEQ, AQCR VII NORTHERN VIRGINIA, July 1, 2017

SITE I.D.	POLLUTANT MEASURED	METHOD OR INSTRUMENT	SAMPLING INTERVAL	MONITORING OBJECTIVE	SCALE	BEGINNING DATE	MONITOR NETWORK	MONITOR TYPE	LOCATION	LONGITUDE	LATITUDE	CBSAs/ MSAs	
51-013-0020	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	8/1/79		SLAMS	Arlington -	-77.0592	38.8577	47900/	Washington-Arlington-Alexandria, DC-VA-MD-WV
(47-T)	NO2 (42602)	Chemiluminescence	Continuous	Population	Neighborhood	8/1/79		SLAMS	Aurora Hills				
	CO (42101)	Gas Filter Correlation	Continuous	Population	Neighborhood	4/1/81		SLAMS	Visitors Center				
	PM2.5 FRM* (88101	Sequential	1/3	Population	Neighborhood	1/1/99		SLAMS					
51-059-0030	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	7/1/98		SLAMS	Fairfax -	-77.1047	38.7734	47900/	Washington-Arlington-Alexandria, DC-VA-MD-WV
(46-B9)	SO2 (42401)	Pulsed Fluorescence	Continuous	Population	Neighborhood	8/29/13		SLAMS	Lee District park				
	PM2.5 FRM* (88101	Sequential	Daily	Population	Neighborhood	1/1/99		SLAMS					
	PM2.5 (88501)	TEOM	Continuous	Population	Neighborhood	7/1/10		OTHER					
	PM10 (81102)	SSI HI VOL	1/3	Population	Neighborhood	5/1/15		SLAMS					
51-107-1005	O3(44201)	UV Absorption	Continuous	Population	Neighborhood	4/4/98		SLAMS	Loudoun Co. -	-77.4925	39.0247	47900/	Washington-Arlington-Alexandria, DC-VA-MD-WV
(38-I)	NO2 (42602)	Chemiluminescence	Continuous	Population	Neighborhood	4/4/98		SLAMS	Broad Run H.S.				
	PM2.5 FRM* (88101	Sequential	1/3	Population	Neighborhood	1/1/99		SLAMS					
51-153-0009	O3(44201)	UV Absorption	Continuous	Population	Urban	4/1/91		SLAMS	Prince Wm. Co.	-77.6346	38.8529	47900/	Washington-Arlington-Alexandria, DC-VA-MD-WV
(45-L)	NO2 (42602)	Chemiluminescence	Continuous	Population	Urban	4/1/94		SLAMS	Long Park				
51-510-0020	PM10 (81102)	SSI HI VOL	1/3	Population	Neighborhood	6/4/06		SPECIAL PURPOSI	Alexandria -	-77.1268	38.8050	47900/	Washington-Arlington-Alexandria, DC-VA-MD-WV
(L-126-H)									Tucker Elem. Sch.				
51-059-0031	NO2 (42602)	Chemiluminescence	Continuous	Near Road	Microscale	4/7/16	NEAR ROAD	SLAMS	Fairfax County	77.1835	38.7684	47900/	Washington-Arlington-Alexandria, DC-VA-MD-WV
(46-C2)	CO (42101)	Gas Filter Correlation	Continuous	Near Road	Microscale	4/7/16	NEAR ROAD	SLAMS	Backlick Rd. Park				
	PM2.5 FEM (88101)	Beta Attenuation	Continuous	Near Road	Microscale	4/7/16	NEAR ROAD	SPECIAL PURPOSI	and Ride				

There is 1 collocated monitor in AQCR7.
A collocated PM2.5 FRM is located at Station 47-T, 510130020, Aurora Hills Visitor Center, Arlington

* Per 58.10(b)(7) this site is suitable for comparison with the NAAQS as described in 40 CFR §58.30.

USEPA, Federal Monitors, CASTNET , July 1, 2017

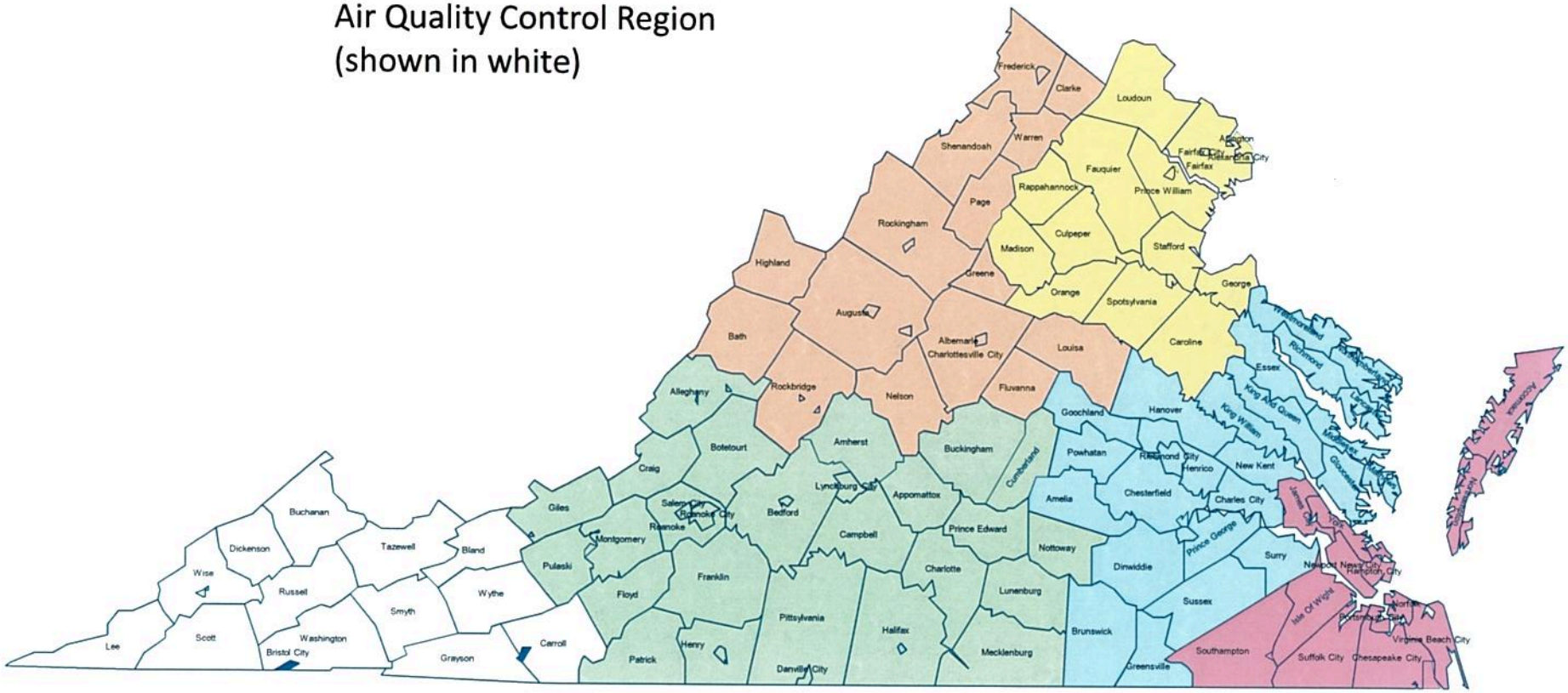
SITE I.D.	POLLUTANT MEASURED	METHOD OR INSTRUMENT	SAMPLING INTERVAL	MONITORING OBJECTIVE	SCALE	BEGINNING DATE	MONITOR NETWORK	MONITOR TYPE	LOCATION	LONGITUDE	LATITUDE	CBSAs/ MSAs	
51-147-9991 PED108	O3(44201)	UV Adsorption (047)	Continuous	Highest Concentration	Regional	1/1/2011	CASTNET	EPA	Prince Edward Gallion State Forest Burkeville VA	-78.307067	37.165222	NA	
51-071-9991 VPI120	O3(44201)	UV Adsorption (047)	Continious	Highest Concentration	Regional	4/1/2011	CASTNET	EPA	Giles County 1856 Horton Lane Newport, VA	-80.55751	37.329832	13980/	Blacksburg-Christiansburg-Radford, VA

ATTACHMENT 2
OVERHEAD VIEWS OF MONITORING SITES WITH IDENTIFYING ADDRESS INFORMATION

Each overhead view contains a brief discussion of the original purpose for the site being located where it is. In some cases the current reason for the siting has changed.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

AQCR 1 – Eastern Tennessee-Southwest Virginia
Air Quality Control Region
(shown in white)



Counties: Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, Wythe

Cities: Bristol, Galax, Norton

CBSA/MSA: 28700 – Kingsport-Bristol-Bristol, TN-VA

Gladeville Elementary School, Galax, 23-A

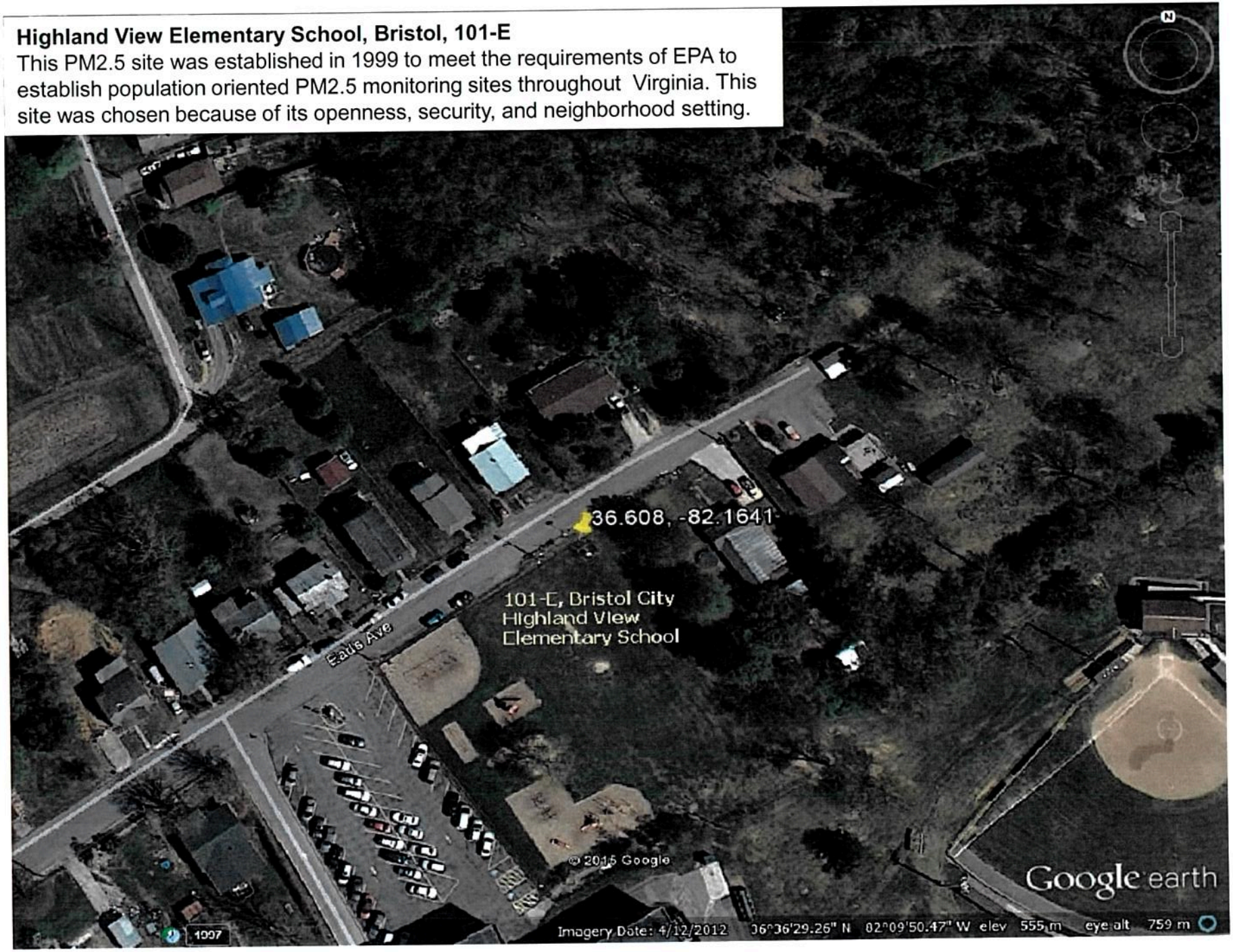
TSP was installed in June 1983 as a replacement site for a close by monitoring location that was unduly influenced by a nearby source. The TSP was removed January 1989 and a PM10 was installed in its place.

Rural Retreat, Wythe County, 16-B

This site began in April 1990 as a replacement site for the Marion, VA ozone site. This site is downwind of the VOC sources and more representative of the area.

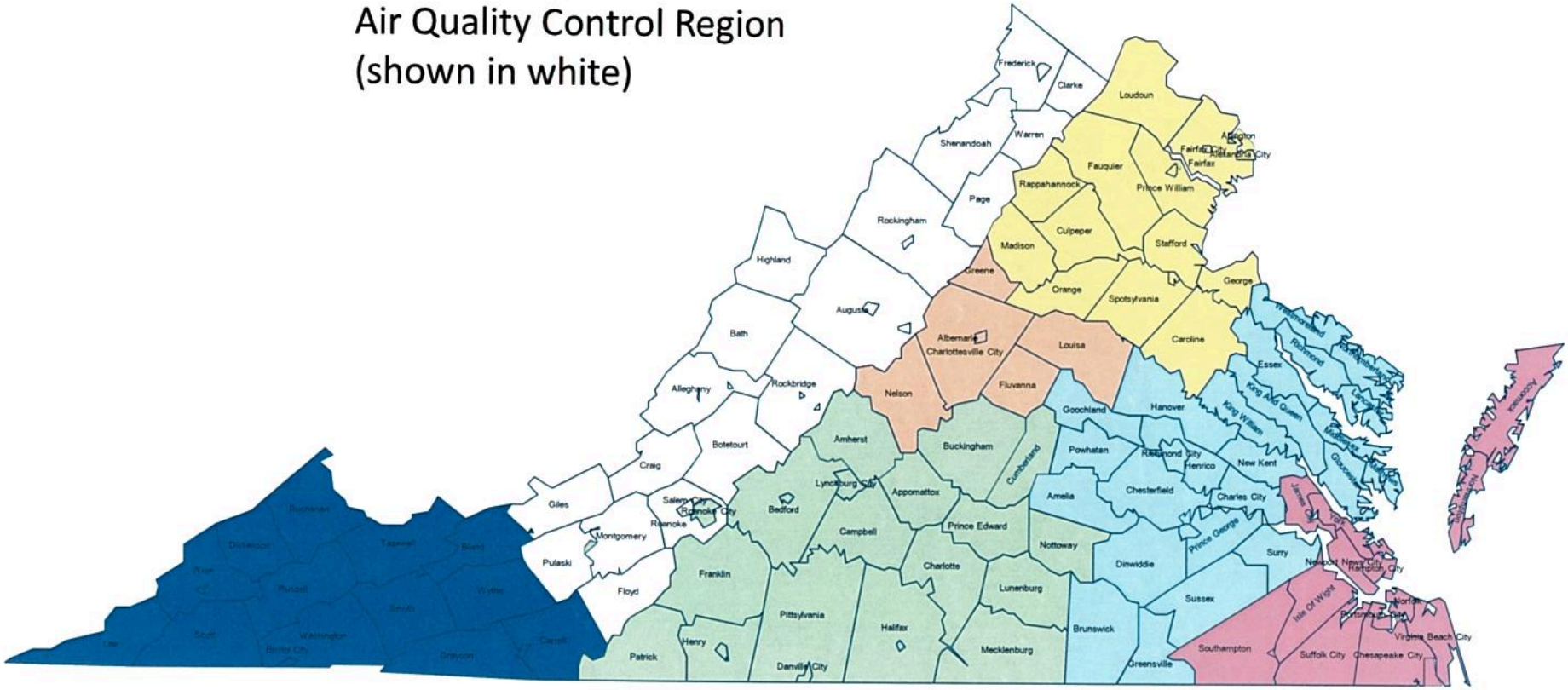
Highland View Elementary School, Bristol, 101-E

This PM2.5 site was established in 1999 to meet the requirements of EPA to establish population oriented PM2.5 monitoring sites throughout Virginia. This site was chosen because of its openness, security, and neighborhood setting.



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

AQCR 2 – Valley of Virginia Intrastate
Air Quality Control Region
(shown in white)



Counties: Alleghany, Augusta, Bath, Botetourt, Clarke, Craig, Floyd, Frederick, Giles, Highland, Montgomery, Page, Pulaski, Roanoke, Rockbridge, Rockingham, Shenandoah, Warren

Cities: Buena Vista, Clifton Forge, Covington, Harrisonburg, Lexington, Radford, Roanoke, Salem, Staunton, Waynesboro, Winchester

CBSA/MSA: 49020 – Winchester VA-WV; 40220 – Roanoke, VA; 25500 – Harrisonburg, VA

Rest, Frederick County, 28-J

Of the counties in Virginia with high VOC emissions and no ozone monitoring, Frederick County was deemed a candidate for a monitoring site. This site was the first choice due to its downwind direction from Winchester and its good security. Ozone sampling began in 1991. In 2006-2007, the environmental group SHENAIR purchased an environmental shelter and TEOM PM2.5 sampler for VA DEQ. In the fall of 2007, the shelter was installed and a 24-hr PM2.5 sampler was also added.

Winchester, 134-C

In 1985, the Winchester area was identified as having a need for particulate data, and a TSP sampler was installed on the roof of the courthouse. In 1989 the TSP sampler was replaced by a PM10 24-hr sampler.

Herman Horn Elem. School, Vinton, 19-A6

This site was installed at the request of locality (Roanoke County Health Department). NO2 sampling began in December 1980 and Ozone was added in August 1981. In January 1987, SO2 and CO analyzers were added in effort to consolidate monitoring efforts in the Roanoke area. In 2013, PM2.5 24-hr and continuous samplers were added.

Natural Bridge Station, 21-C

This site is a cooperative effort between VA DEQ and the National Forest Service. Sampling began in April 1999. The current shelter was supplied by the Forest Service, and the sampling equipment was supplied by VA DEQ. The area is rural, open and has good security.

VDOT, Rockingham County, 26-F

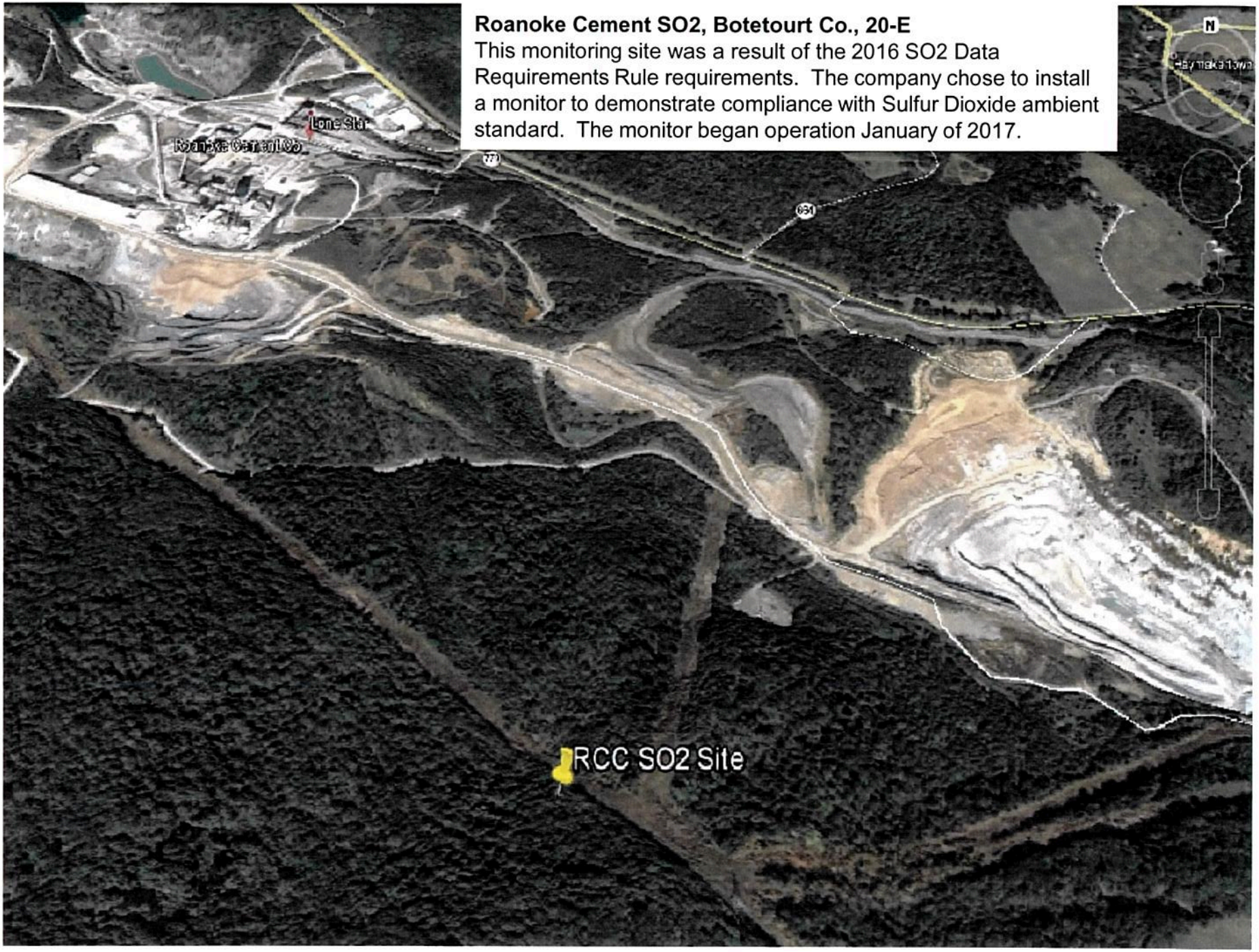
This site was established as a replacement for a monitoring site to the south of the city of Harrisonburg. This site is ten miles north of the city and began in April 2004. On the property of the VDOT it is situated between Route 11 and I-81, with open air flow and good security.

Salem High School, Salem, 110-C

PM2.5 sampling on the roof of the Salem Fire Department stopped in 2006 when roof repairs and construction reconfigured the roof making sampling at this location untenable. After a long search, a spot at Salem High School was found that offered free air flow, good accessibility and very good security. The site was installed and began operation in late 2008.

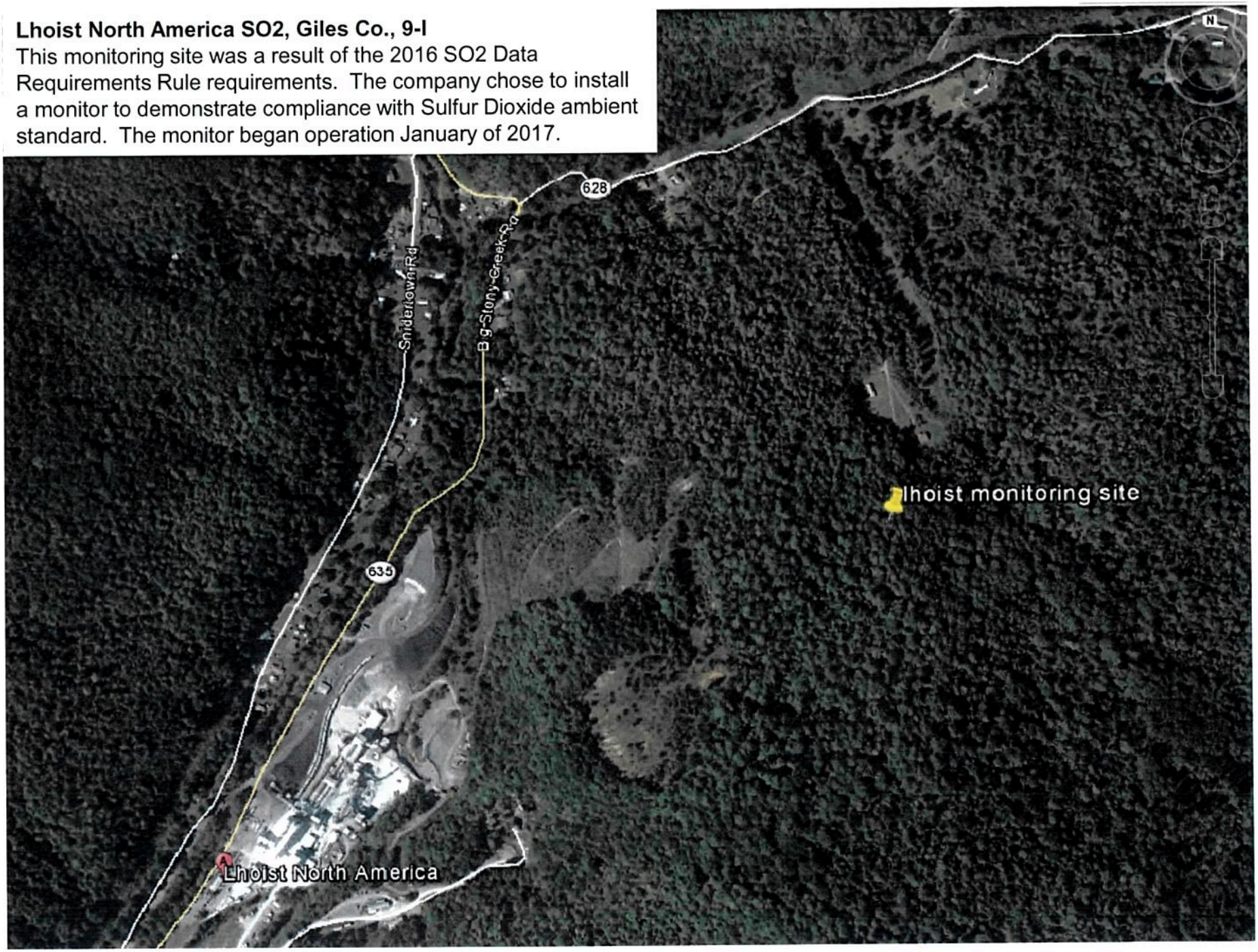
Mario Industries, Roanoke, 109-N

Lead sampler was installed in late 2014 as a replacement to the Lead monitoring site at Cherry Hill Circle, Roanoke. Site is situated in Roanoke River valley as a source specific Lead(Pb) monitor.

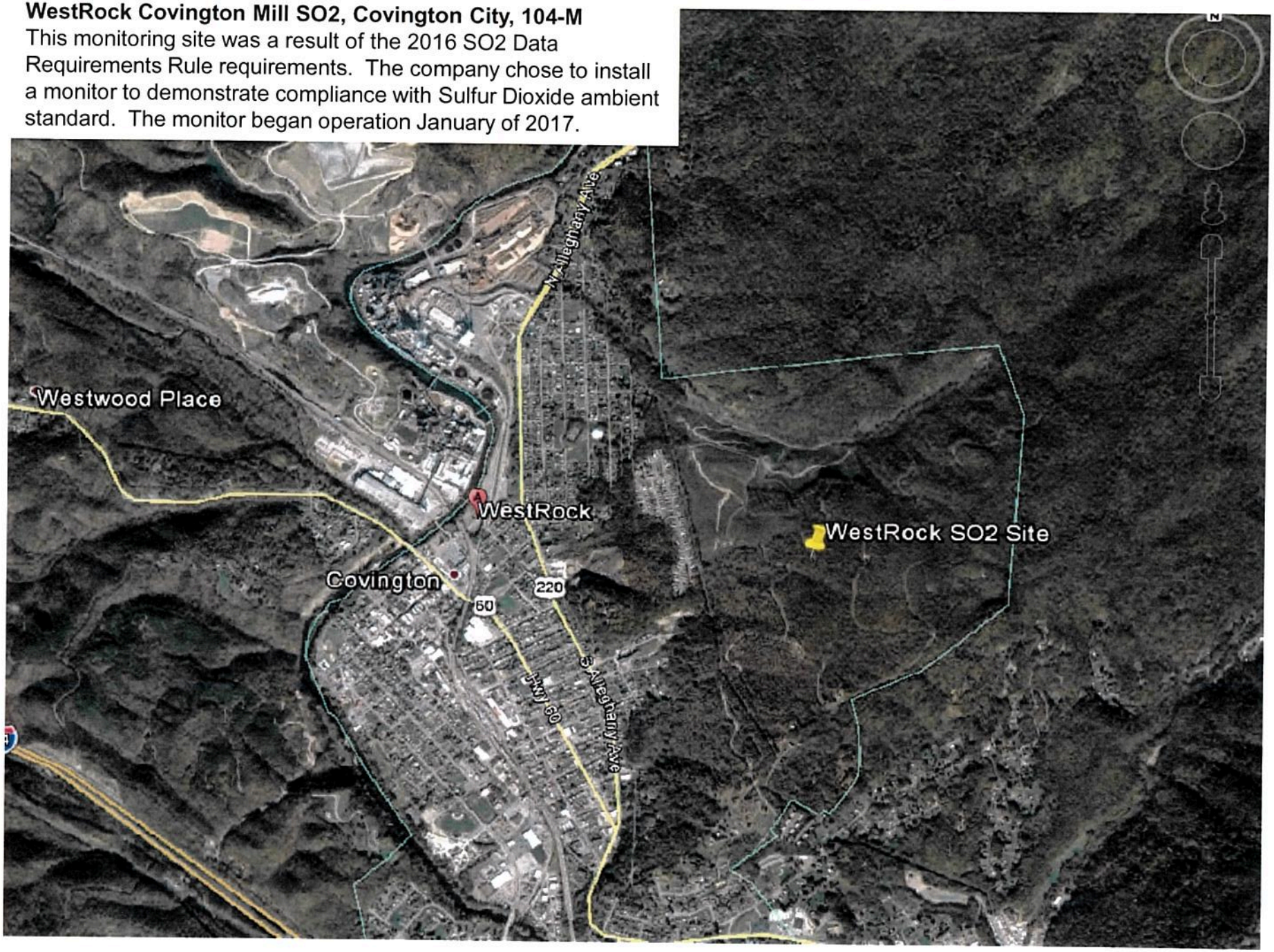

Roanoke Cement SO2, Botetourt Co., 20-E
This monitoring site was a result of the 2016 SO2 Data Requirements Rule requirements. The company chose to install a monitor to demonstrate compliance with Sulfur Dioxide ambient standard. The monitor began operation January of 2017.
Lone Star
Roanoke Cement Co.
779
951
N
Haymakertown
RCC SO2 Site

Lhoist North America SO2, Giles Co., 9-I

This monitoring site was a result of the 2016 SO2 Data Requirements Rule requirements. The company chose to install a monitor to demonstrate compliance with Sulfur Dioxide ambient standard. The monitor began operation January of 2017.

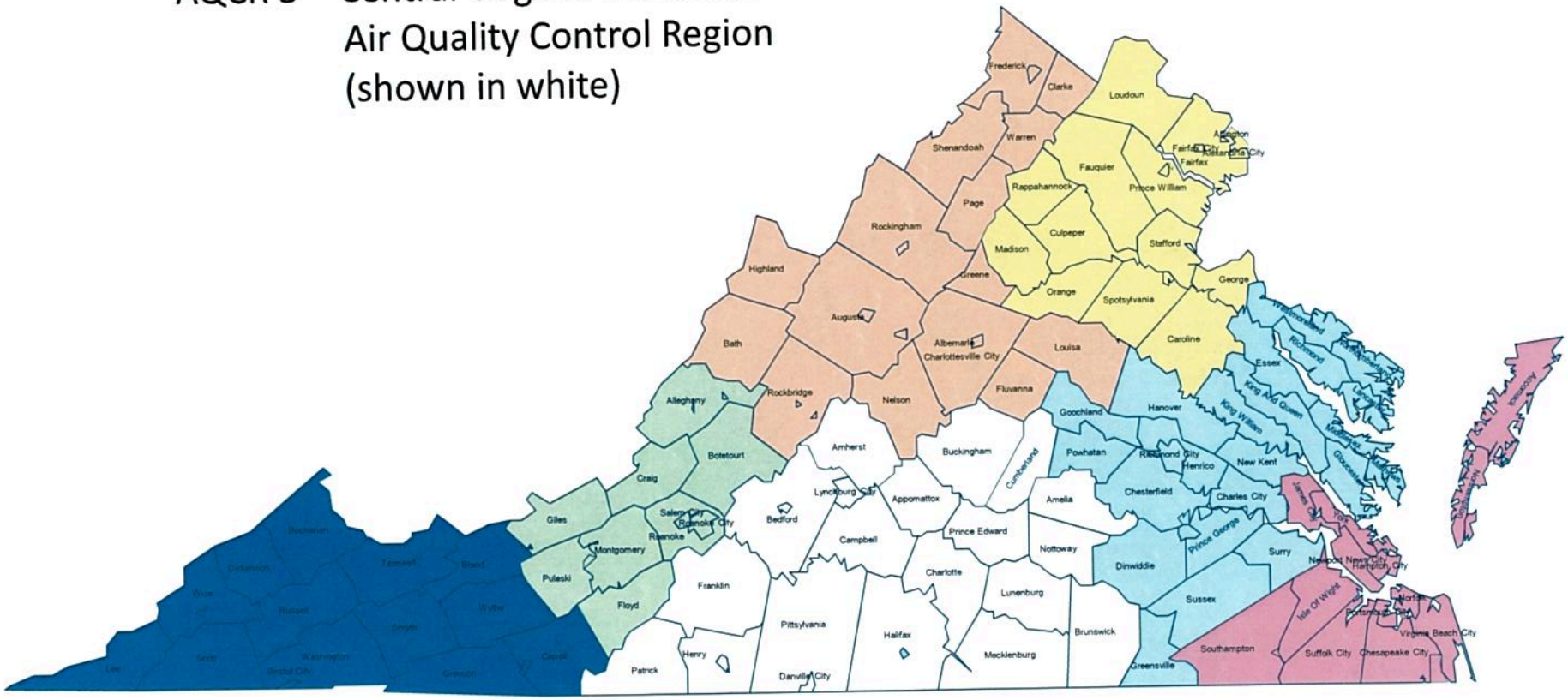


WestRock Covington Mill SO2, Covington City, 104-M
This monitoring site was a result of the 2016 SO2 Data Requirements Rule requirements. The company chose to install a monitor to demonstrate compliance with Sulfur Dioxide ambient standard. The monitor began operation January of 2017.



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

AQCR 3 – Central Virginia Intrastate
Air Quality Control Region
(shown in white)



Counties: Amelia, Amherst, Appomattox, Bedford, Brunswick, Buckingham, Campbell, Charlotte, Cumberland, Franklin, Halifax, Henry, Lunenburg, Mecklenburg, Nottoway, Patrick, Pittsylvania, Prince Edward

Cities: Bedford, Danville, Lynchburg, Martinsville, South Boston

CBSA/MSA: 31340 – Lynchburg, VA

Leesville Road Water Tower, Lynchburg, 155-Q

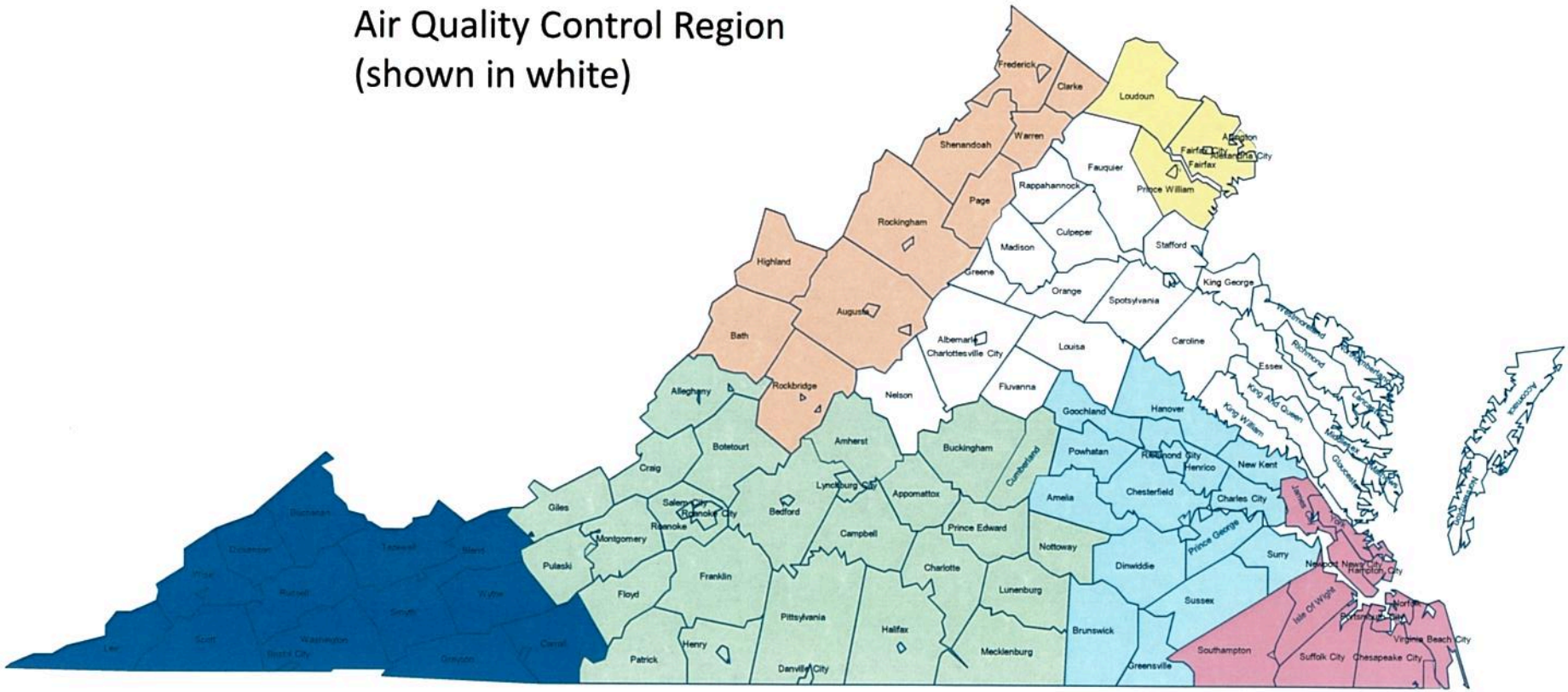
When the PM2.5 network was put together, it was determined a sampler was needed in Lynchburg. A sampler was installed but it was found that the site had electrical problems that could not be resolved. A secure location was found on city property and the PM2.5 sampler began operation at this site in April 2003.

Central Virginia Training Center, Amherst County, 53-G

The EPA Lead monitoring network required a monitoring site downwind from a Lynchburg source. It also required at least one collocated site. Begun in late 2010, this site is the proper distance downwind of the source and offers good security. With two samplers, it fulfills the requirement of a collocated Lead site.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

AQCR 4 – Northeast Virginia Intrastate
Air Quality Control Region
(shown in white)



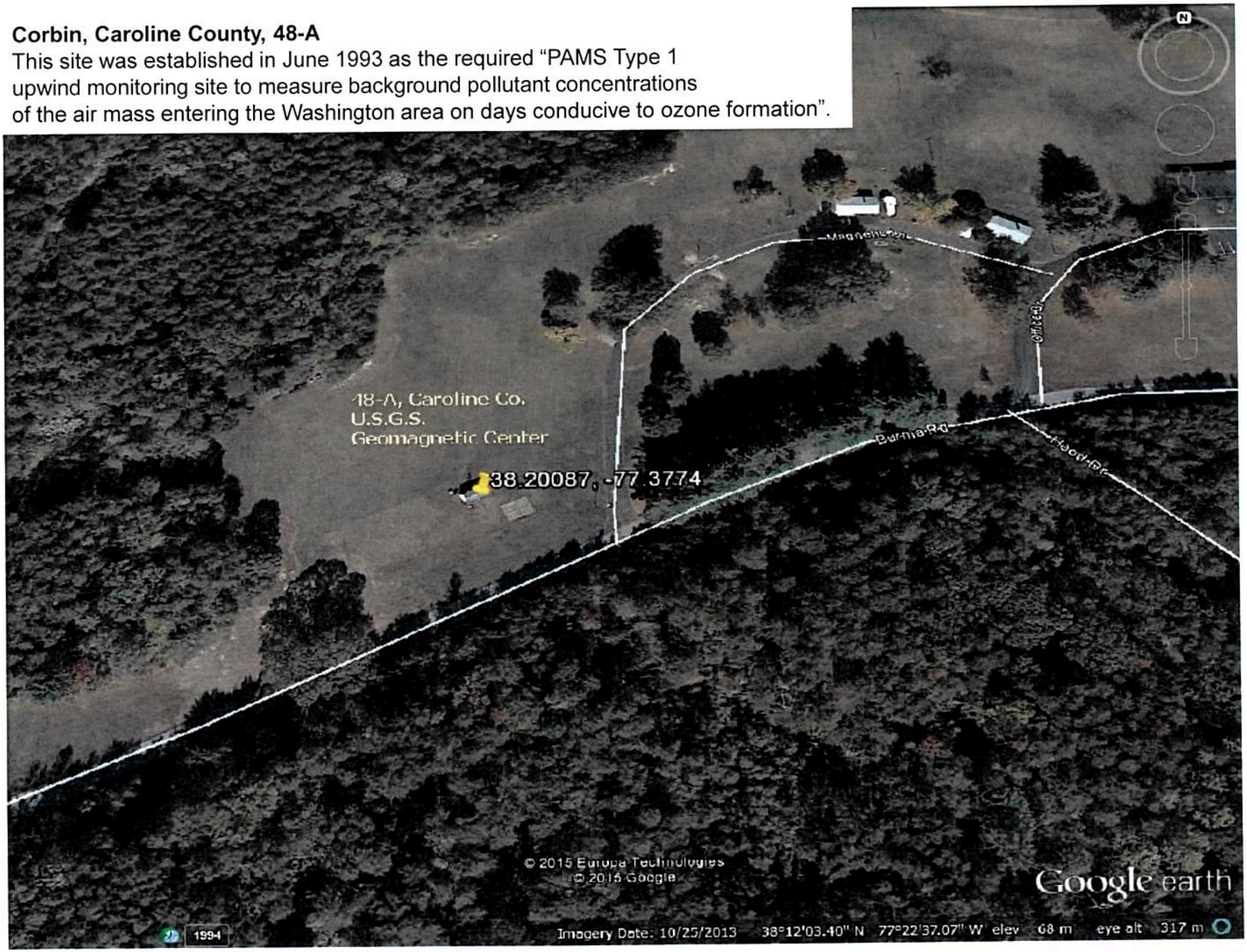
Counties: Accomack, Albemarle, Caroline, Culpeper, Essex, Fauquier, Fluvanna, Gloucester, Greene, King and Queen, King George, King William, Lancaster, Louisa, Madison, Mathews, Middlesex, Nelson, Northampton, Northumberland, Orange, Rappahannock, Richmond, Spotsylvania, Stafford, Westmoreland

Cities: Charlottesville, Fredericksburg

CBSA/MSA: 40060 – Richmond, VA; 16820 – Charlottesville, VA; 47900 – Washington-Arlington-Alexandria, DC-VA-MD-WV

Corbin, Caroline County, 48-A

This site was established in June 1993 as the required "PAMS Type 1 upwind monitoring site to measure background pollutant concentrations of the air mass entering the Washington area on days conducive to ozone formation".



Sumerduck, Fauquier County, 37-B

This ozone monitoring site was established in 1981 as an upwind site for the Washington DC metropolitan area. It is situated in the correct upwind quadrant, the proper distance away, and on state property.

Widewater Elementary School, Stafford County, 44-A

The Ozone monitoring site at Widewater Elementary School was established to characterize ambient ozone concentrations in Stafford County. Ozone sampling began in September 1992,

Big Meadows, Shenandoah National Park, 35-A

This is a National Park Service air monitoring site. Their data was incorporated into the Virginia reported data in May 1983. The ozone analyzer and data collection equipment belongs to NPS. A TEOM PM2.5 purchased by VISTAS was installed by VA DEQ at the site in the second half of 2004. In 2007, TEOM ownership was turned over to VA DEQ.

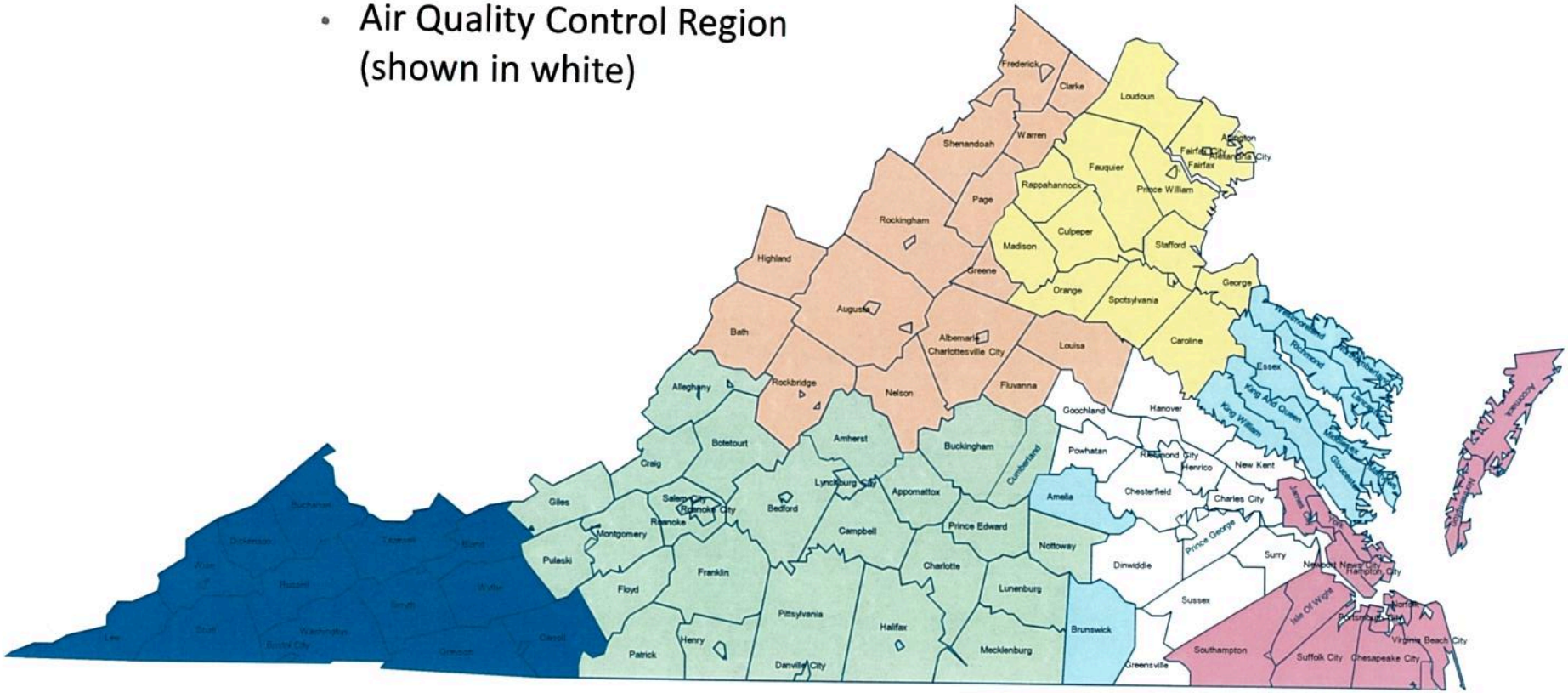
Albemarle High School, Albemarle County, 33-A

Since 2002, the Charlottesville area had been designated as a priority for Ozone and PM2.5 sampling. A monitoring site at Albemarle High School was finally found and eventually approved by the School Board. Inspected by EPA III, the site began operation in April 0f 2008..

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

AQCR 5 – State Capital Intrastate

- Air Quality Control Region (shown in white)



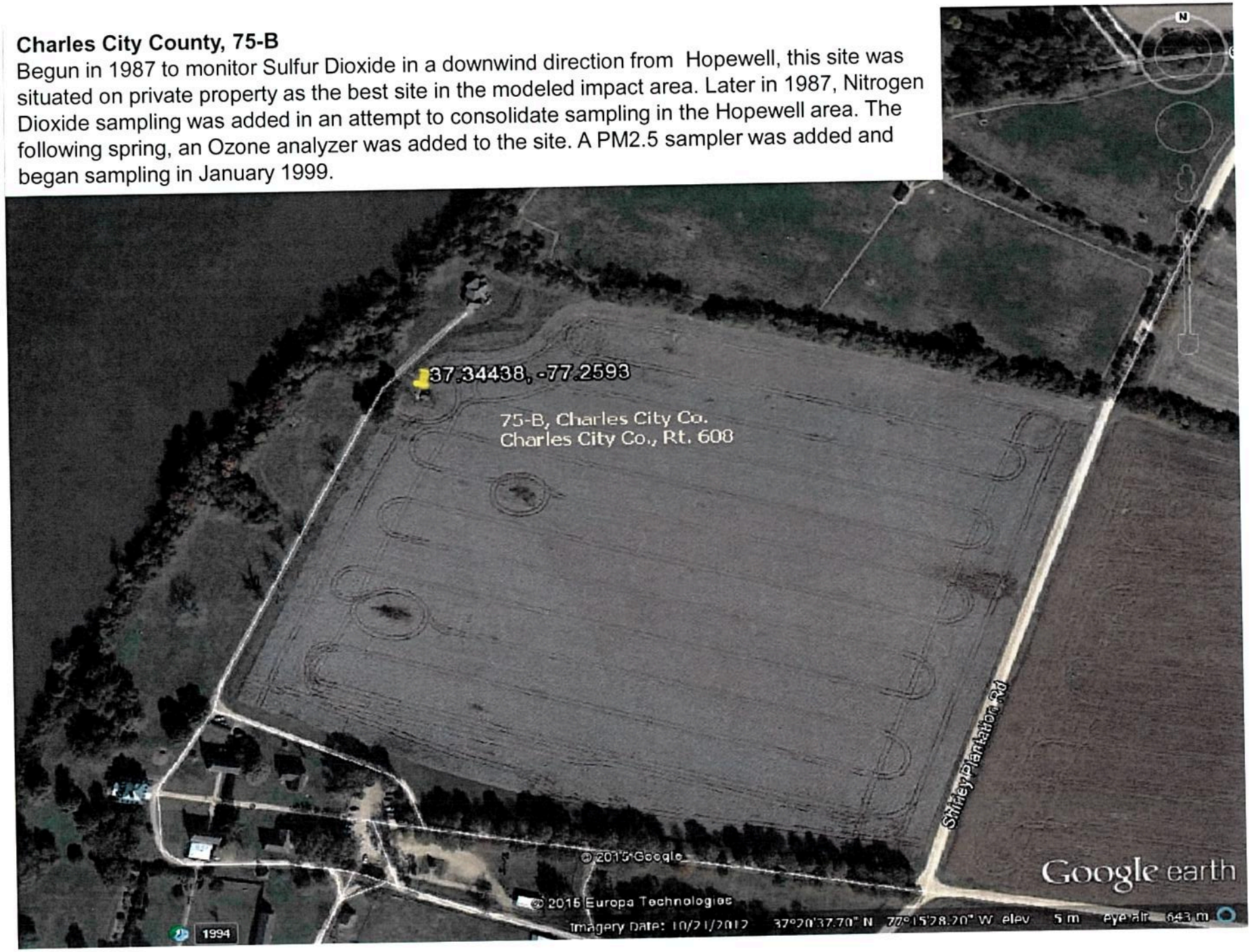
Counties: Charles City, Chesterfield, Dinwiddie, Goochland, Greensville, Hanover, Henrico, New Kent, Powhatan, Prince George, Surry, Sussex

Cities: Colonial Heights, Emporia, Hopewell, Petersburg, Richmond

CBSA/MSA: 40060 – Richmond, VA

Charles City County, 75-B

Begun in 1987 to monitor Sulfur Dioxide in a downwind direction from Hopewell, this site was situated on private property as the best site in the modeled impact area. Later in 1987, Nitrogen Dioxide sampling was added in an attempt to consolidate sampling in the Hopewell area. The following spring, an Ozone analyzer was added to the site. A PM2.5 sampler was added and began sampling in January 1999.

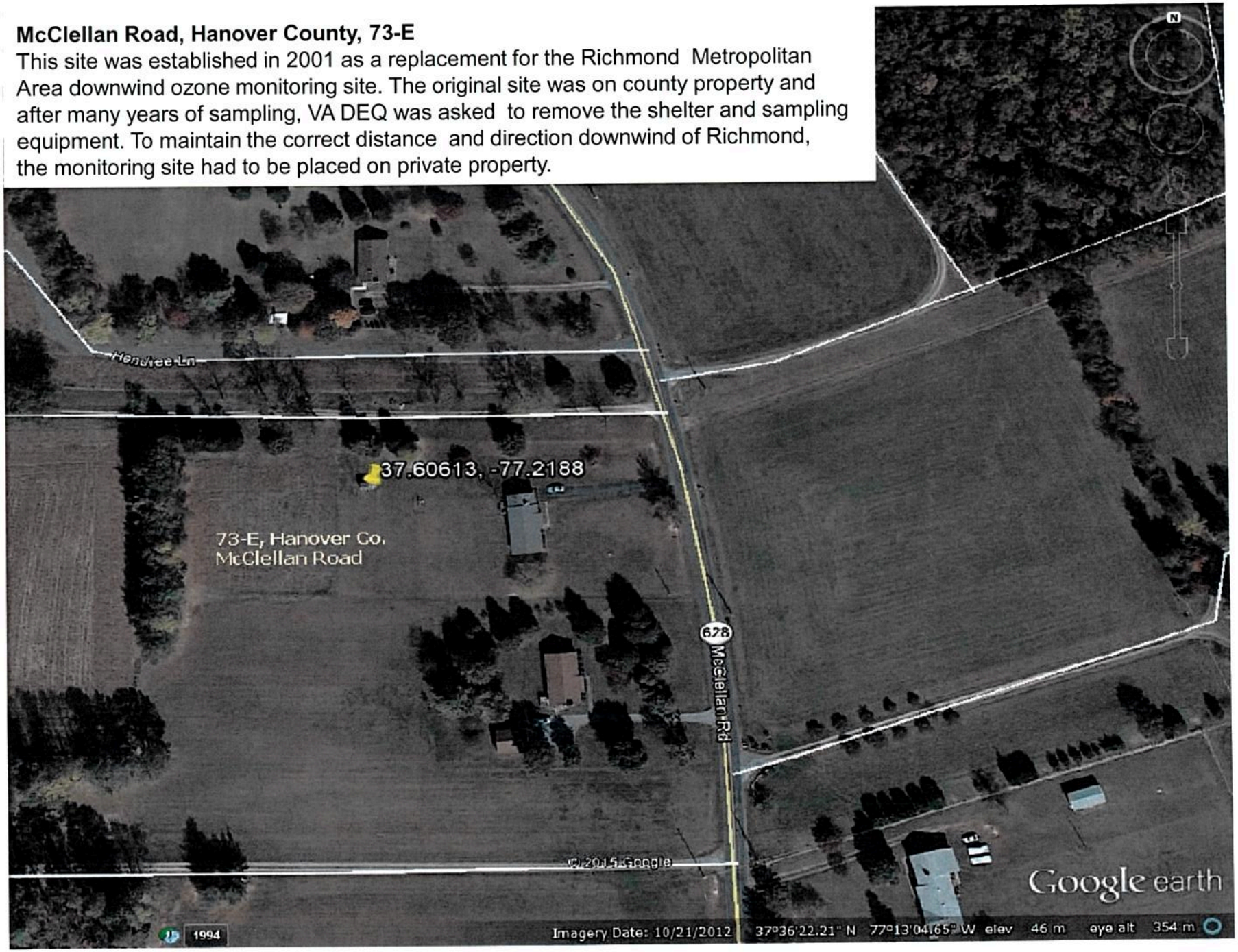


Beach Road, Chesterfield, 71-H

Air monitoring began in April 1980 at the Beach Road VDOT shop in Chesterfield County. Because of its location and security, this site was picked as the upwind Ozone site for the Richmond metropolitan area.

McClellan Road, Hanover County, 73-E

This site was established in 2001 as a replacement for the Richmond Metropolitan Area downwind ozone monitoring site. The original site was on county property and after many years of sampling, VA DEQ was asked to remove the shelter and sampling equipment. To maintain the correct distance and direction downwind of Richmond, the monitoring site had to be placed on private property.

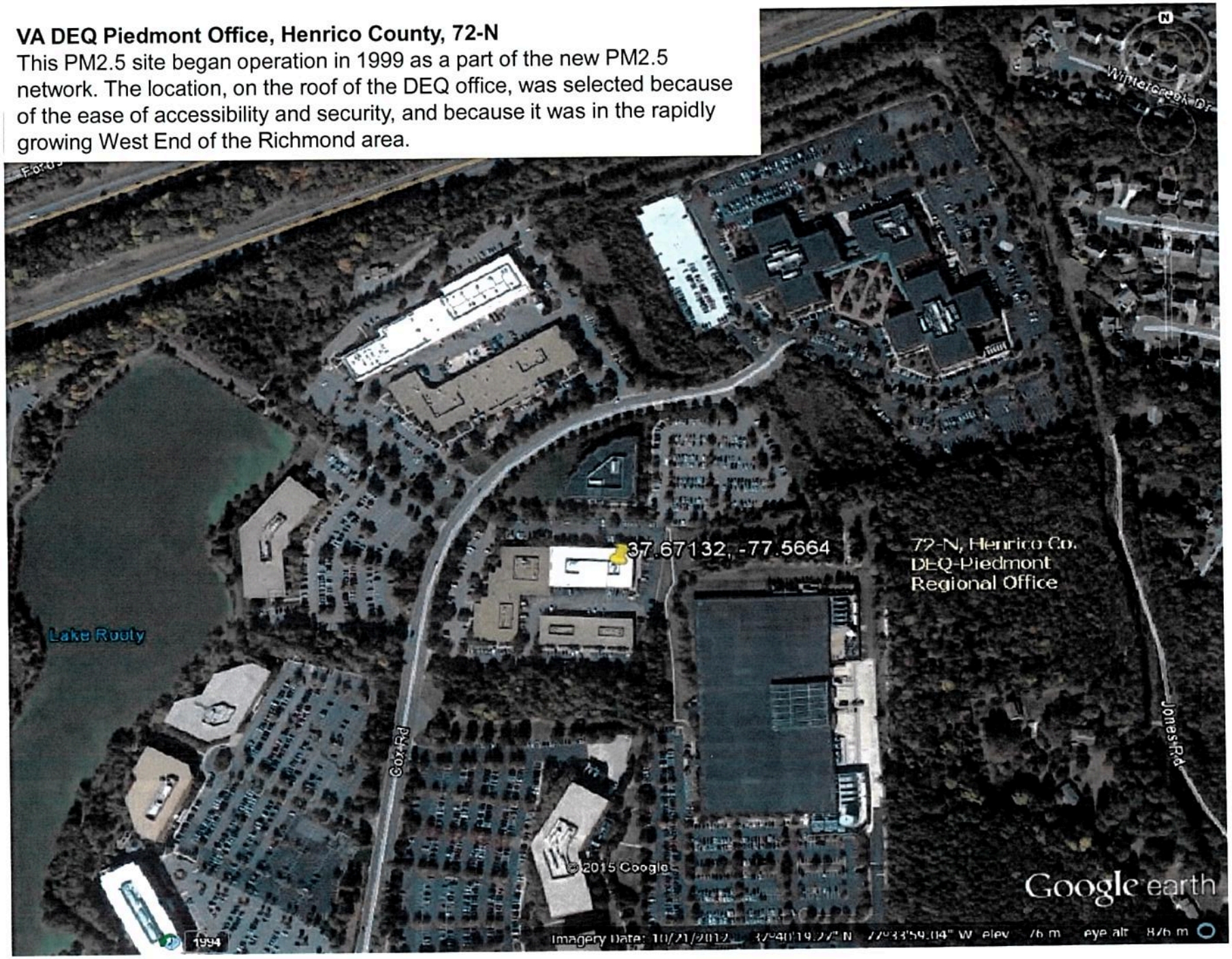


MathScience Innovation Center, Henrico County, 72-M

This site began in 1981 as a replacement monitoring location for sites removed in the city of Richmond. Ozone and SO2 were located in a storage room with a probe support extending above the roof. A shelter was later added as was more instrumentation. In 2008 the MSIC site became a National Air Toxics Trend Site. In 2011 this also became the NCore location for DEQ as well.

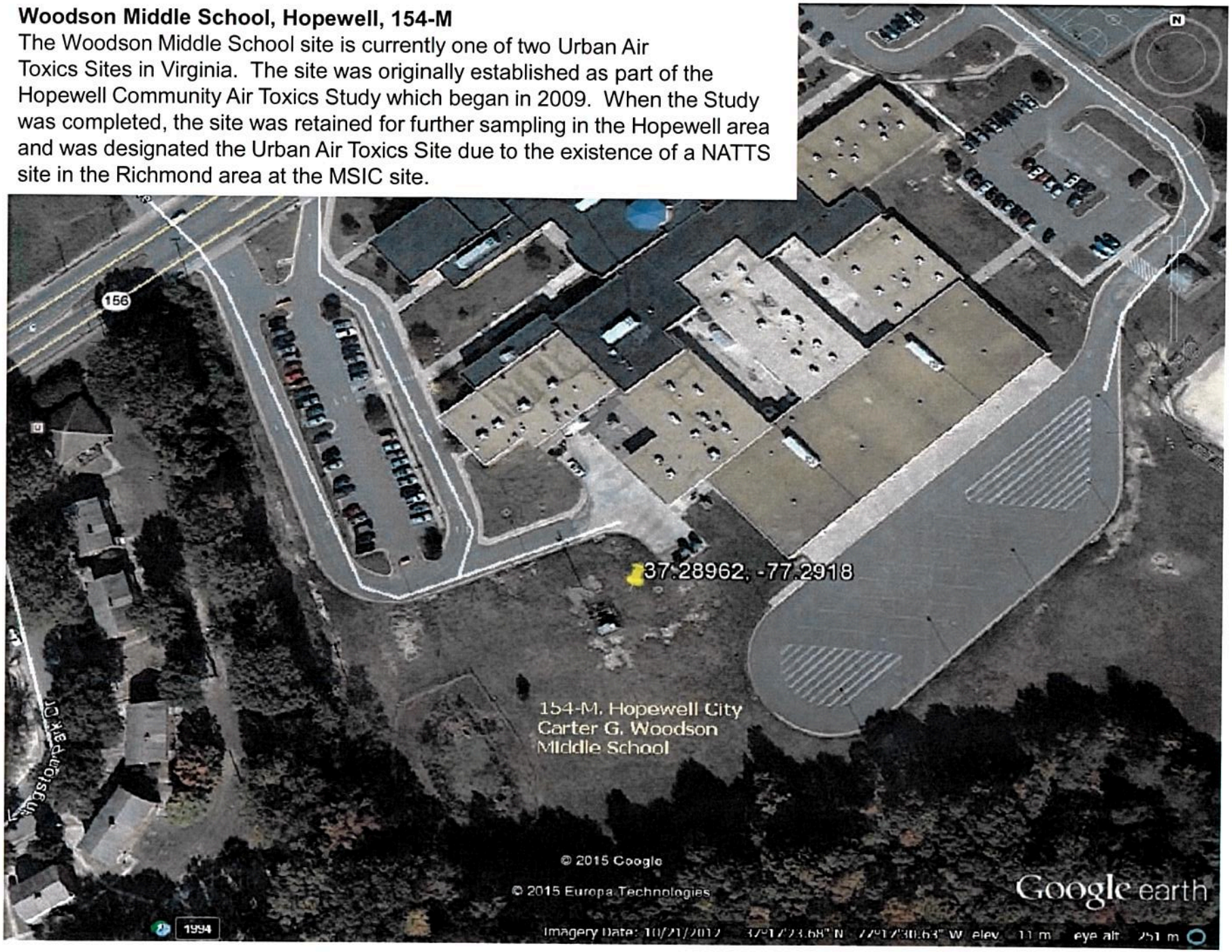
VA DEQ Piedmont Office, Henrico County, 72-N

This PM2.5 site began operation in 1999 as a part of the new PM2.5 network. The location, on the roof of the DEQ office, was selected because of the ease of accessibility and security, and because it was in the rapidly growing West End of the Richmond area.



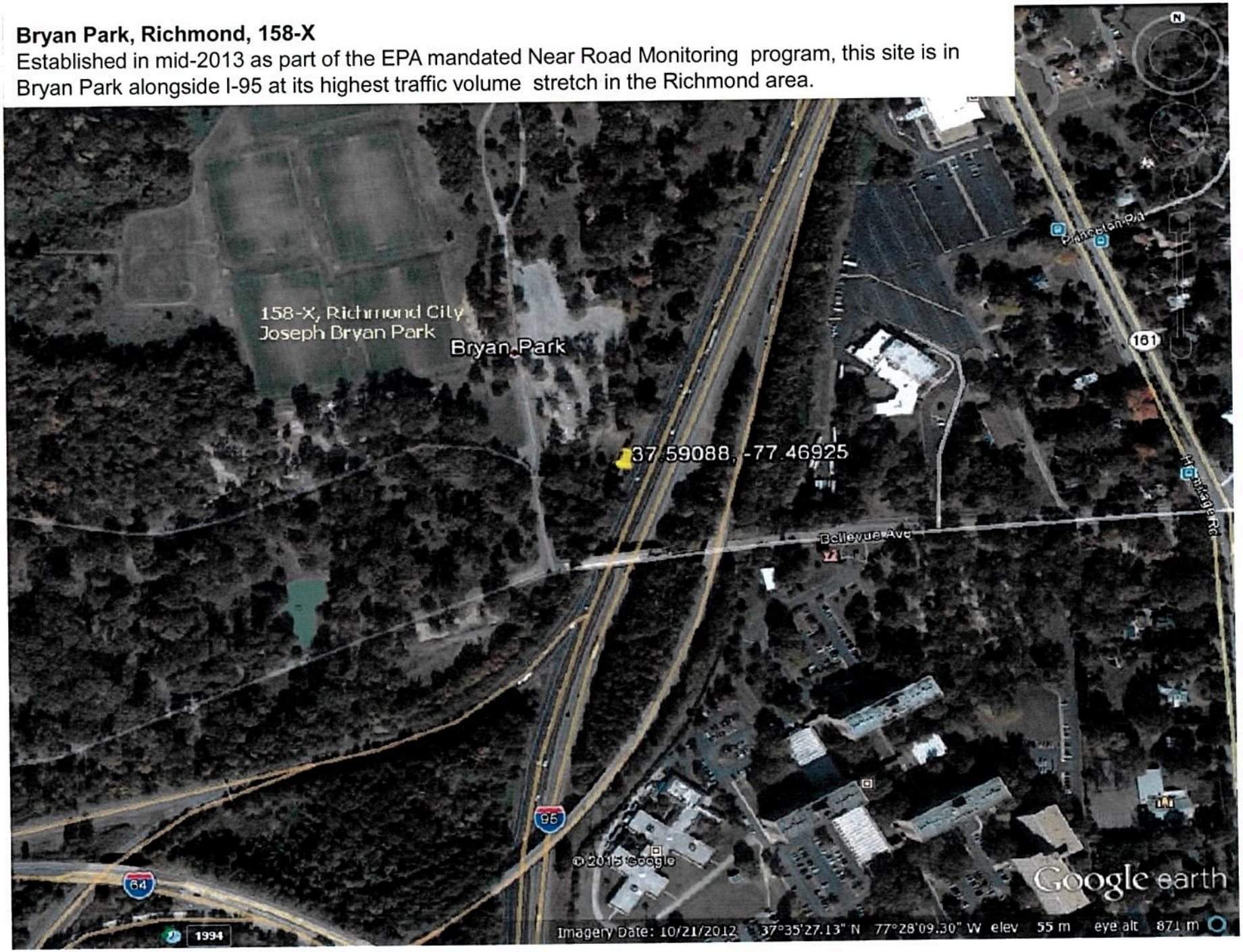
Woodson Middle School, Hopewell, 154-M

The Woodson Middle School site is currently one of two Urban Air Toxics Sites in Virginia. The site was originally established as part of the Hopewell Community Air Toxics Study which began in 2009. When the Study was completed, the site was retained for further sampling in the Hopewell area and was designated the Urban Air Toxics Site due to the existence of a NATTS site in the Richmond area at the MSIC site.



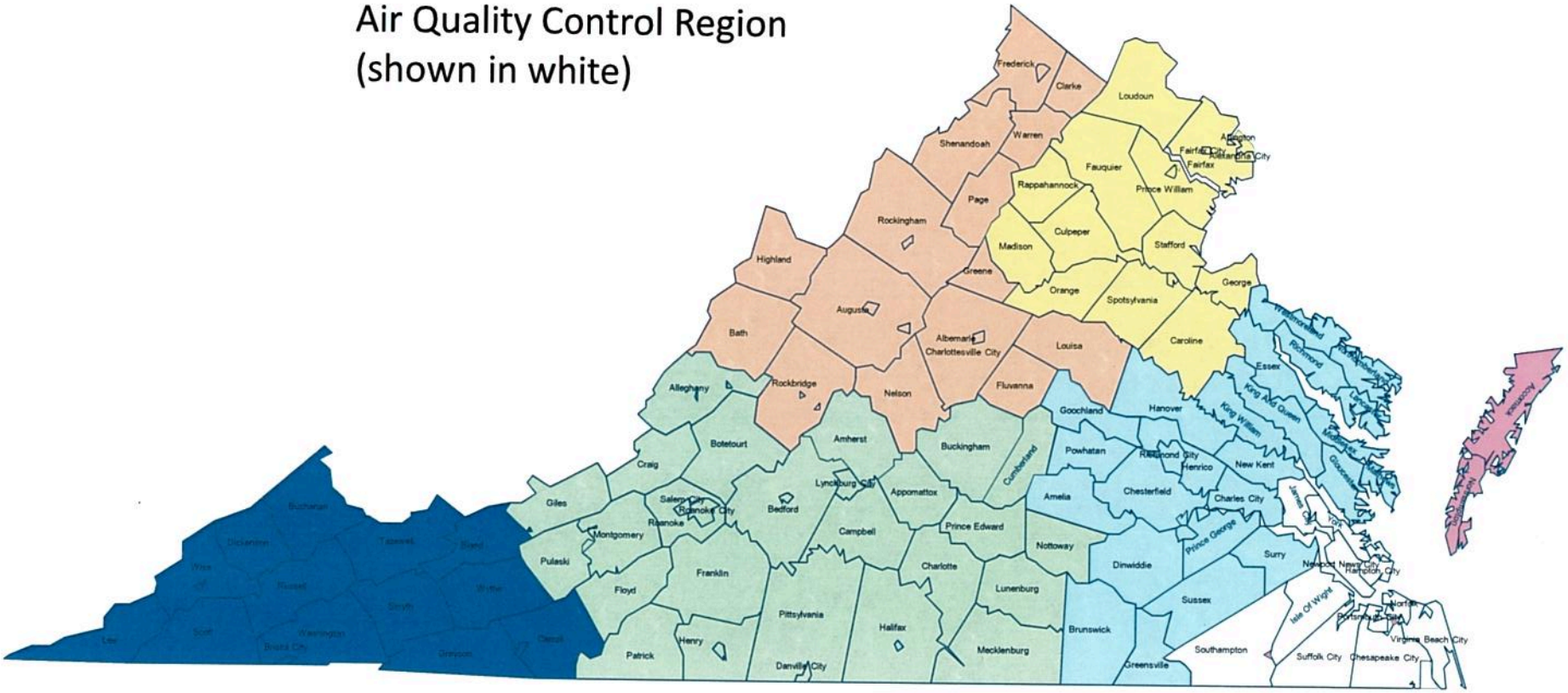
Bryan Park, Richmond, 158-X

Established in mid-2013 as part of the EPA mandated Near Road Monitoring program, this site is in Bryan Park alongside I-95 at its highest traffic volume stretch in the Richmond area.



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

AQCR 6 – Hampton Roads Intrastate
Air Quality Control Region
(shown in white)



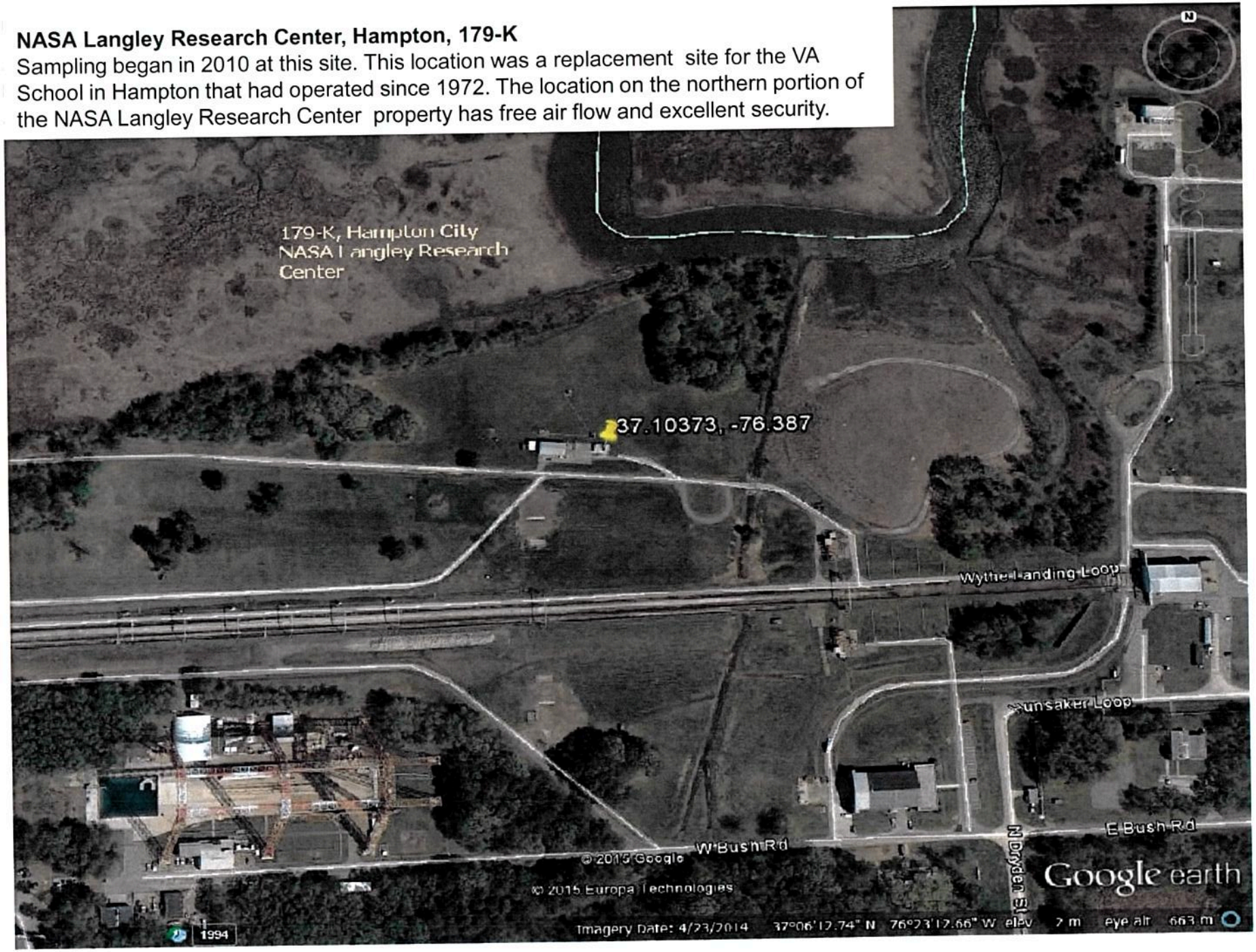
Counties: Isle of Wight, James City, Southampton, York

Cities: Chesapeake, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, Williamsburg

CBSA/MSA: 47260 – Virginia Beach-Norfolk-Newport News, VA-NC

NASA Langley Research Center, Hampton, 179-K

Sampling began in 2010 at this site. This location was a replacement site for the VA School in Hampton that had operated since 1972. The location on the northern portion of the NASA Langley Research Center property has free air flow and excellent security.

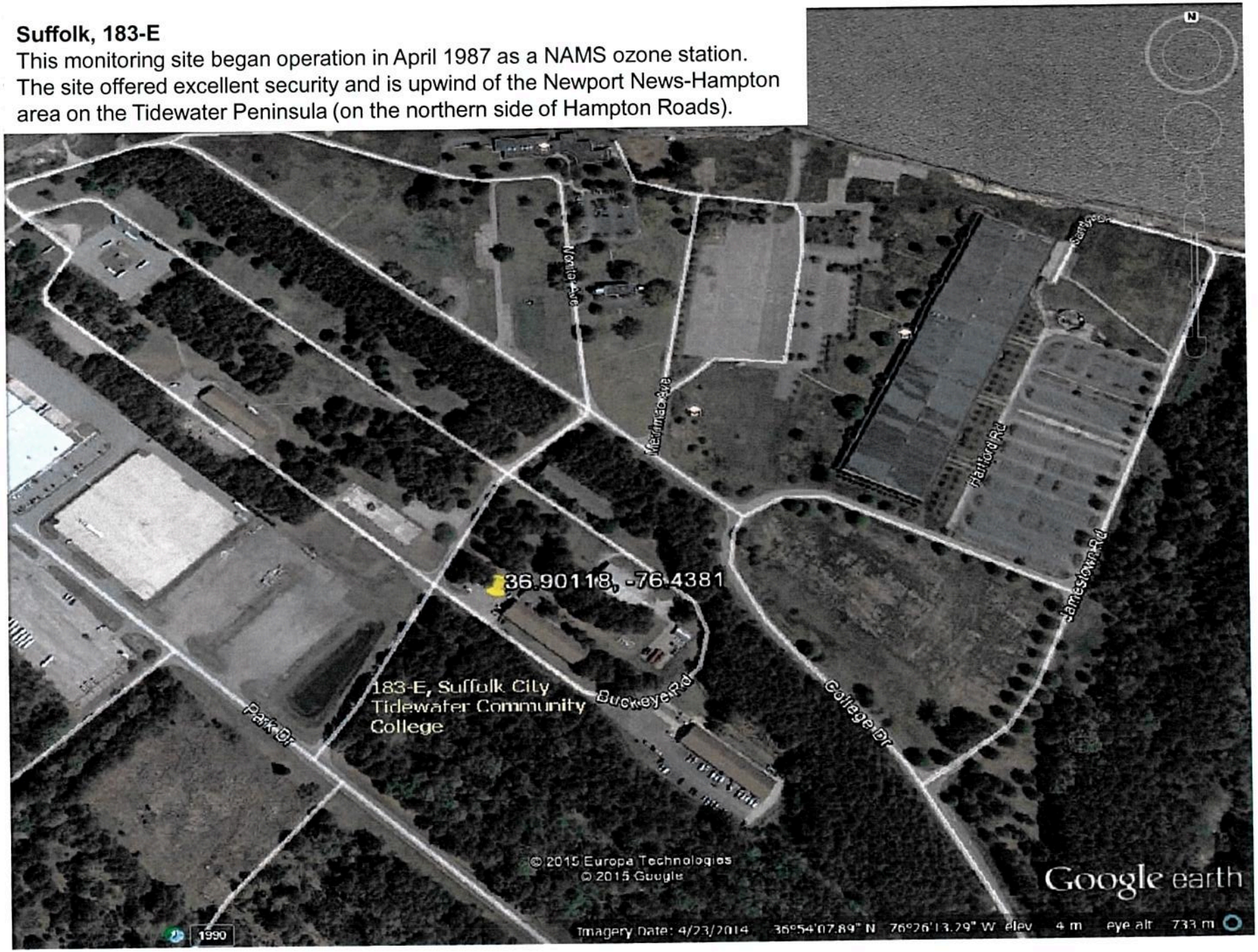


NOAA Storage Lot, Norfolk, 181-A1

This site was established in 2006 as a close-by replacement site for the Norfolk Post Office site that was shut down due to the post office closing. This site was chosen for representativeness of the sampling area, free air flow and excellent security.

Suffolk, 183-E

This monitoring site began operation in April 1987 as a NAMS ozone station. The site offered excellent security and is upwind of the Newport News-Hampton area on the Tidewater Peninsula (on the northern side of Hampton Roads).

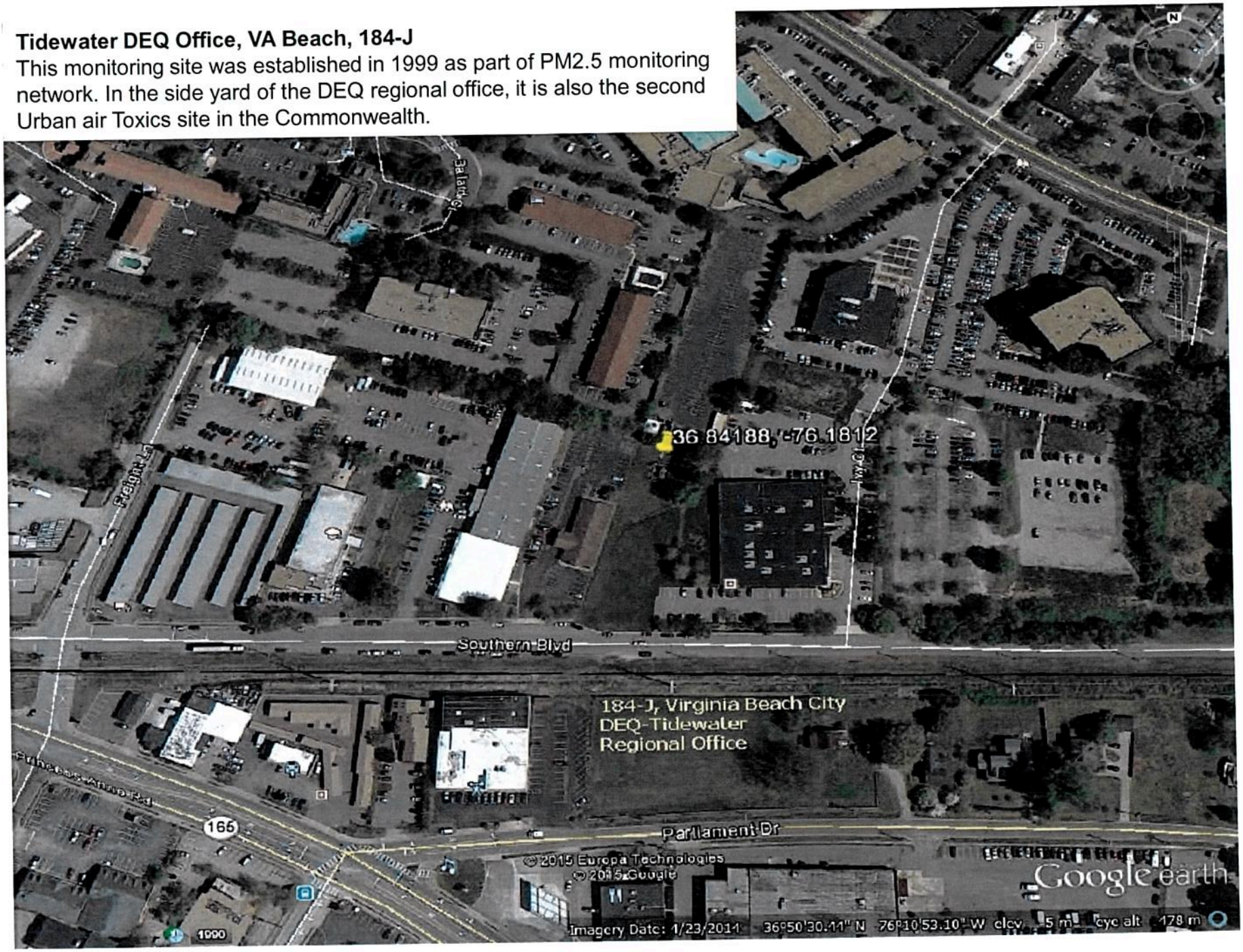


Suffolk, 183-F

This monitoring site was established in 1991as an EPA required replacement for the terminated NAMS ozone monitoring site at the Cheriton Post Office on the eastern shore of Virginia.

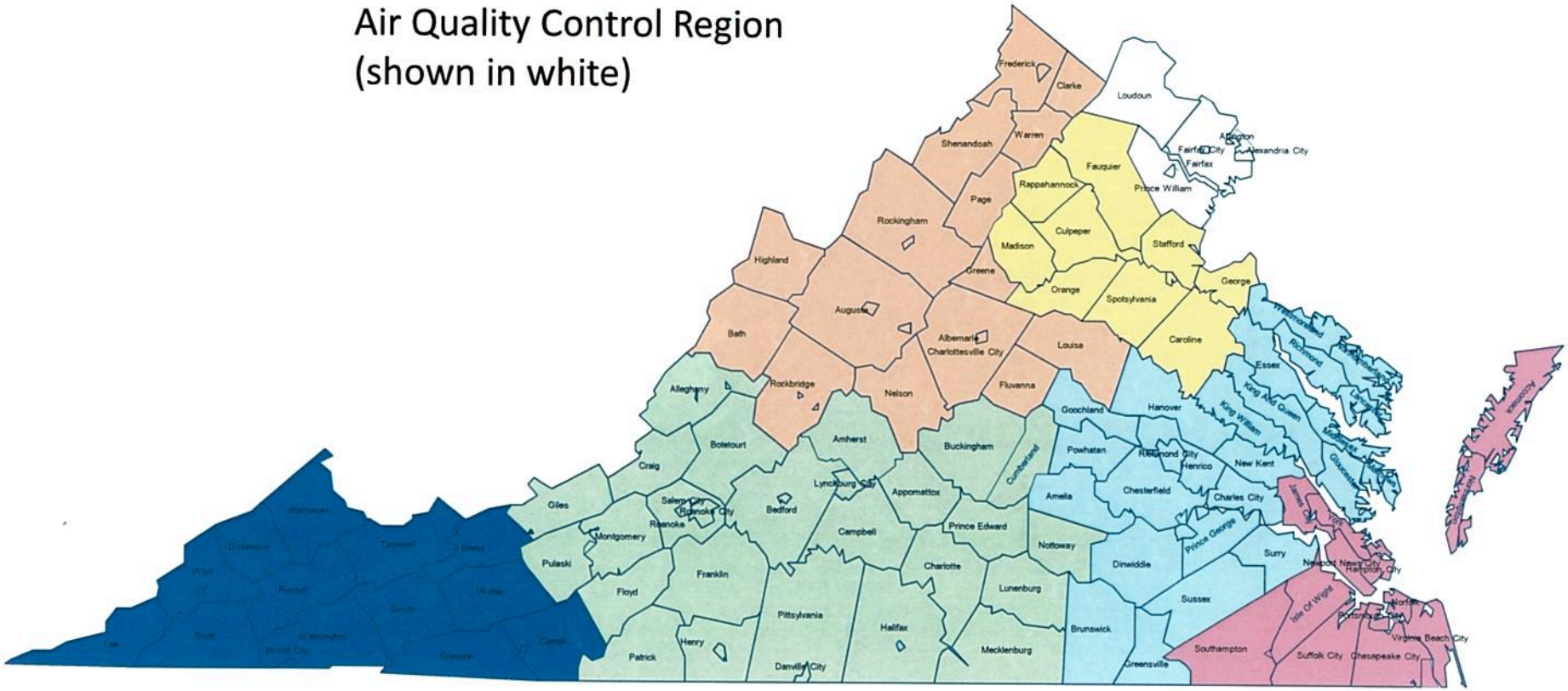
Tidewater DEQ Office, VA Beach, 184-J

This monitoring site was established in 1999 as part of PM2.5 monitoring network. In the side yard of the DEQ regional office, it is also the second Urban air Toxics site in the Commonwealth.



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

AQCR 7 – National Capital Interstate
Air Quality Control Region
(shown in white)



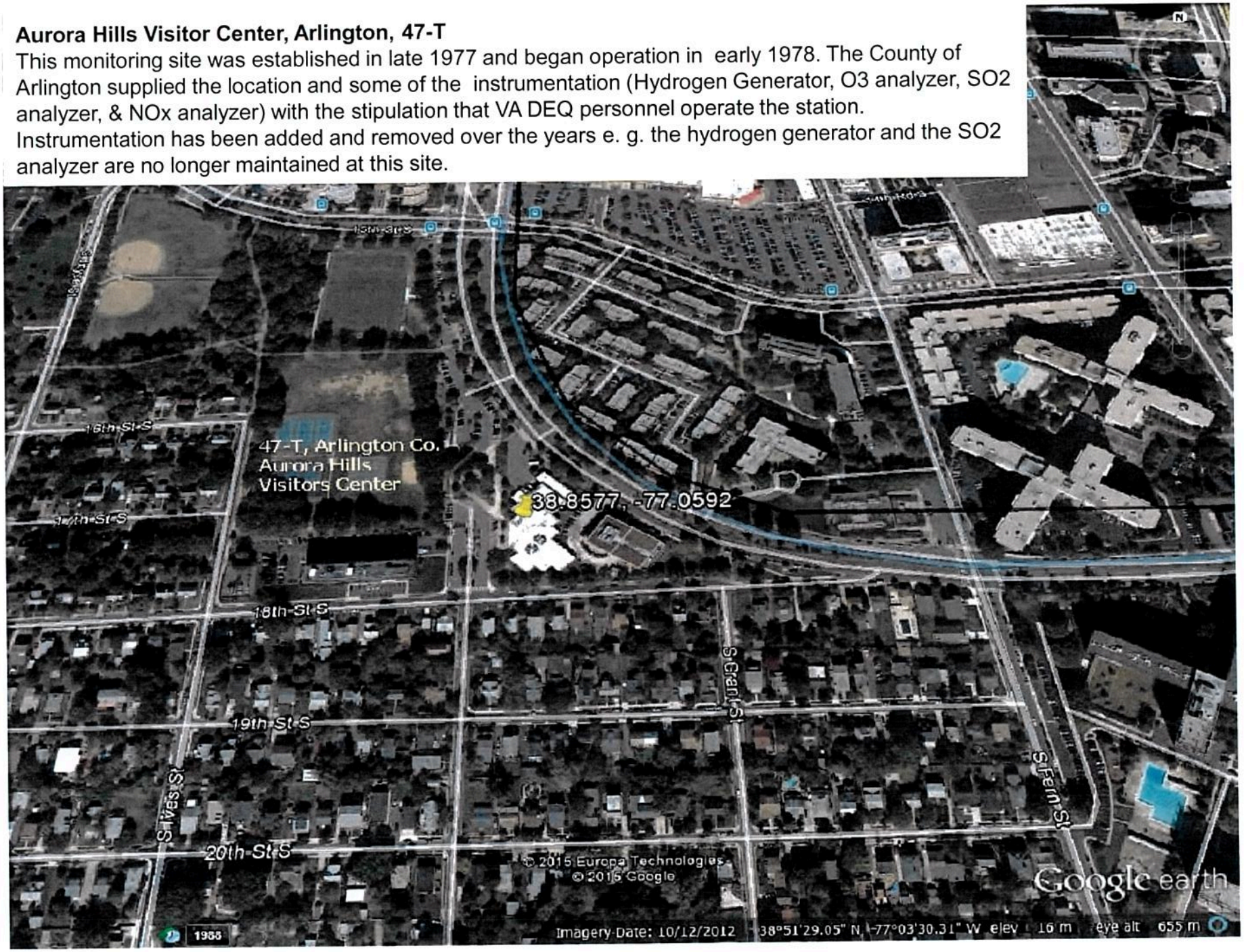
Counties: Arlington, Fairfax, Loudoun, Prince William

Cities: Alexandria, Fairfax, Falls Church, Manassas, Manassas Park

CBSA/MSA: 47900 – Washington-Arlington-Alexandria, DC-VA-MD-WV

Aurora Hills Visitor Center, Arlington, 47-T

This monitoring site was established in late 1977 and began operation in early 1978. The County of Arlington supplied the location and some of the instrumentation (Hydrogen Generator, O3 analyzer, SO2 analyzer, & NOx analyzer) with the stipulation that VA DEQ personnel operate the station. Instrumentation has been added and removed over the years e. g. the hydrogen generator and the SO2 analyzer are no longer maintained at this site.

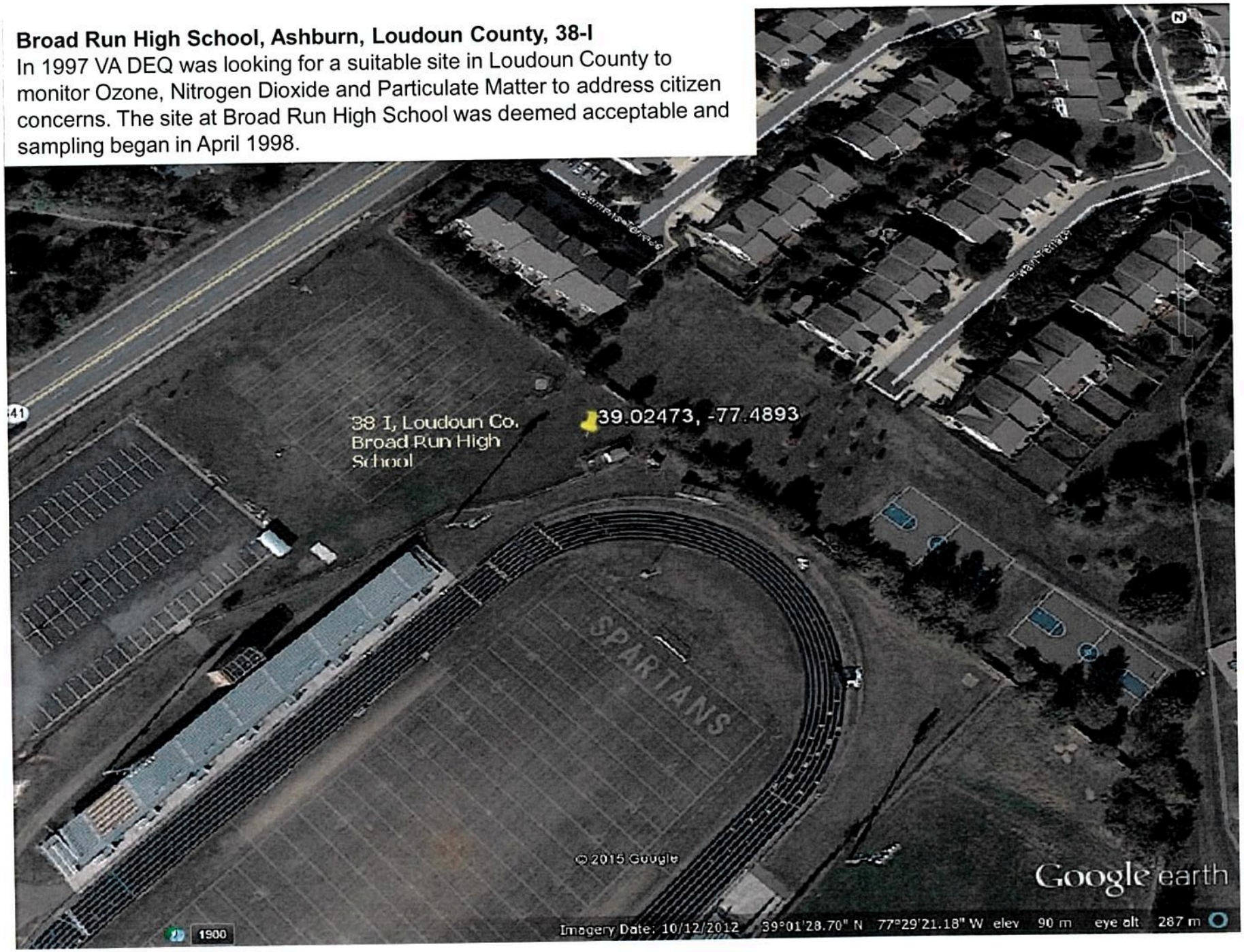


Lee District Park, Fairfax County, 46-B9

The EPA required the Virginia DEQ to establish a PAMS in the secondary downwind direction from the area of maximum ozone precursor emissions for days when higher ozone concentrations were likely to occur. Lee District Park was in a good location for the establishment of this site, a PAMS Type II. Sampling began in July 1998.

Broad Run High School, Ashburn, Loudoun County, 38-I

In 1997 VA DEQ was looking for a suitable site in Loudoun County to monitor Ozone, Nitrogen Dioxide and Particulate Matter to address citizen concerns. The site at Broad Run High School was deemed acceptable and sampling began in April 1998.

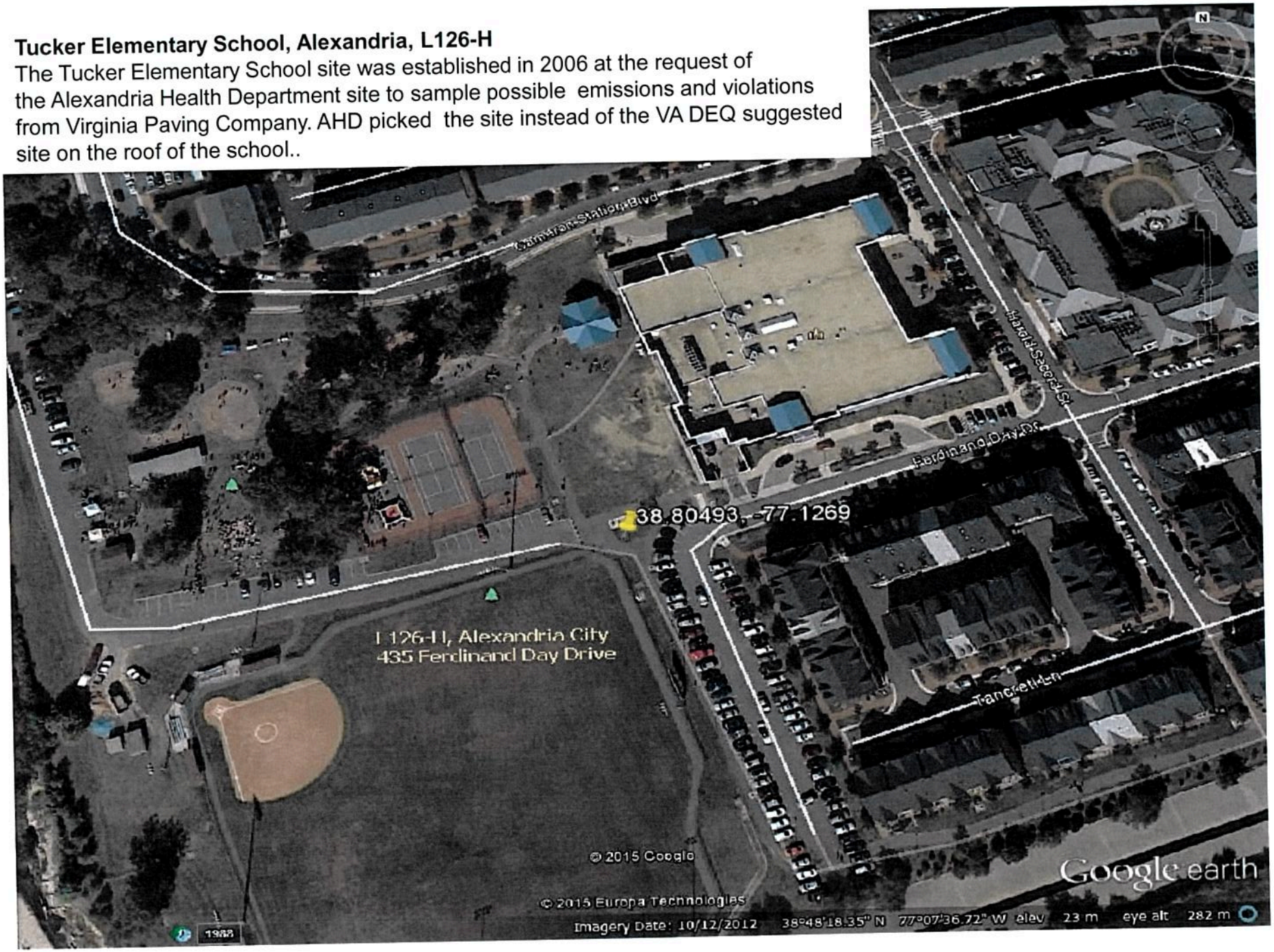


Long Park, Prince William County, 45-L

The agency Strategic Plan of 1990 identified Prince William County as an area requiring ozone monitoring. A suitable location in the James Long Park was selected and ozone sampling began in April 1991. In 1994, NOx sampling at this site began.

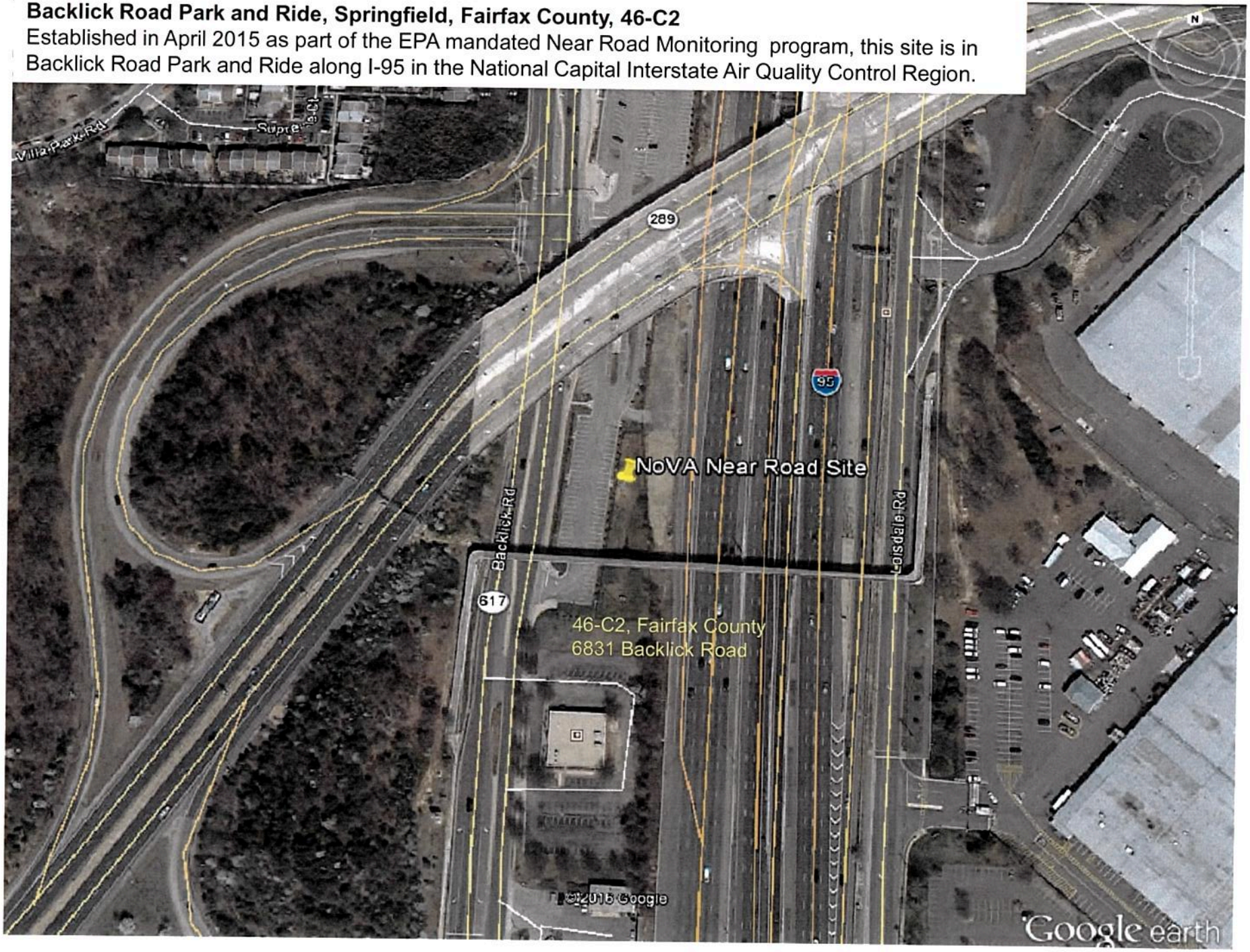
Tucker Elementary School, Alexandria, L126-H

The Tucker Elementary School site was established in 2006 at the request of the Alexandria Health Department site to sample possible emissions and violations from Virginia Paving Company. AHD picked the site instead of the VA DEQ suggested site on the roof of the school..



Backlick Road Park and Ride, Springfield, Fairfax County, 46-C2

Established in April 2015 as part of the EPA mandated Near Road Monitoring program, this site is in Backlick Road Park and Ride along I-95 in the National Capital Interstate Air Quality Control Region.

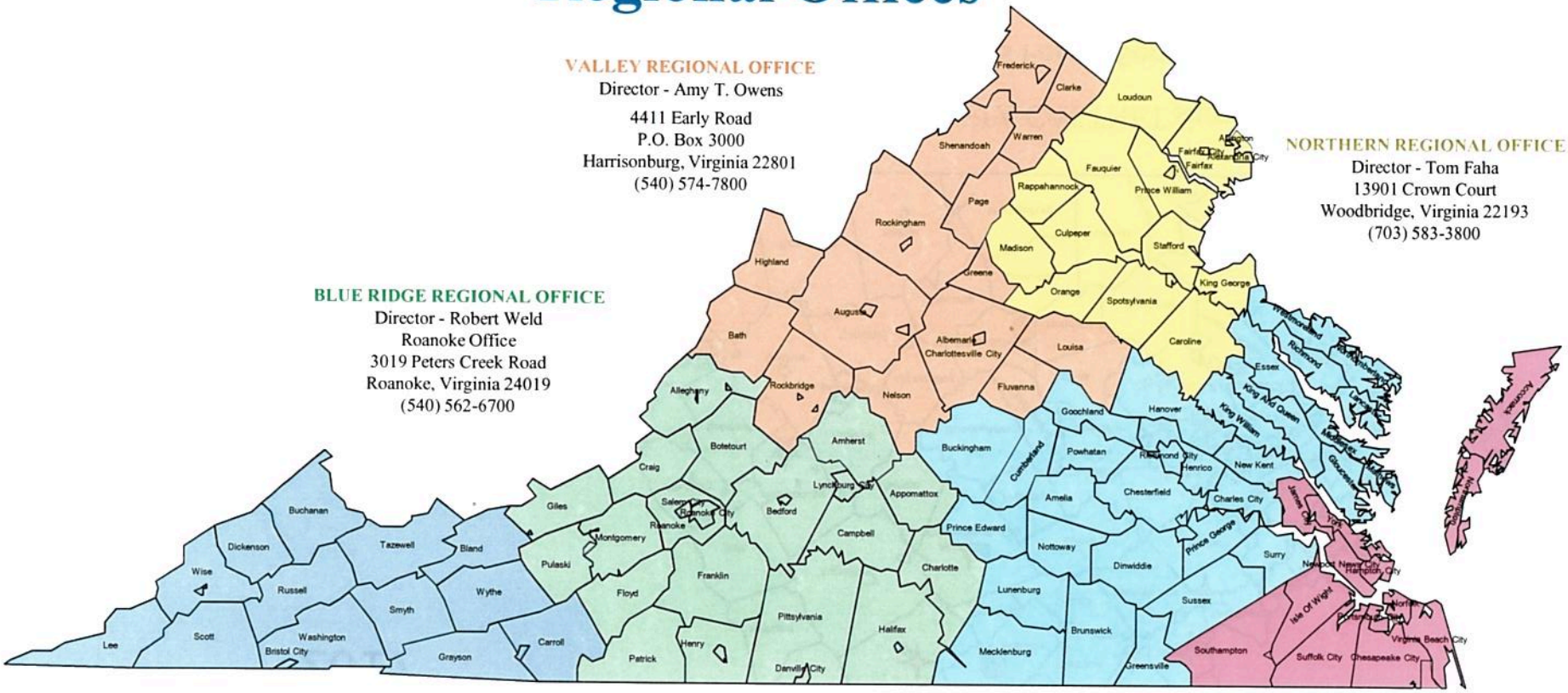


ATTACHMENT 3

SITE MAPS – MONITOR LOCATIONS

Effective May 1, 2017 the Lynchburg Satellite Office of the Blue Ridge Regional Office was permanently closed. The revised County assignments for both the Blue Ridge Regional Office and for the Piedmont Regional Offices are contained in the regional Map on page 1.

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY
Regional Offices



VALLEY REGIONAL OFFICE
Director - Amy T. Owens
4411 Early Road
P.O. Box 3000
Harrisonburg, Virginia 22801
(540) 574-7800

NORTHERN REGIONAL OFFICE
Director - Tom Faha
13901 Crown Court
Woodbridge, Virginia 22193
(703) 583-3800

BLUE RIDGE REGIONAL OFFICE
Director - Robert Weld
Roanoke Office
3019 Peters Creek Road
Roanoke, Virginia 24019
(540) 562-6700

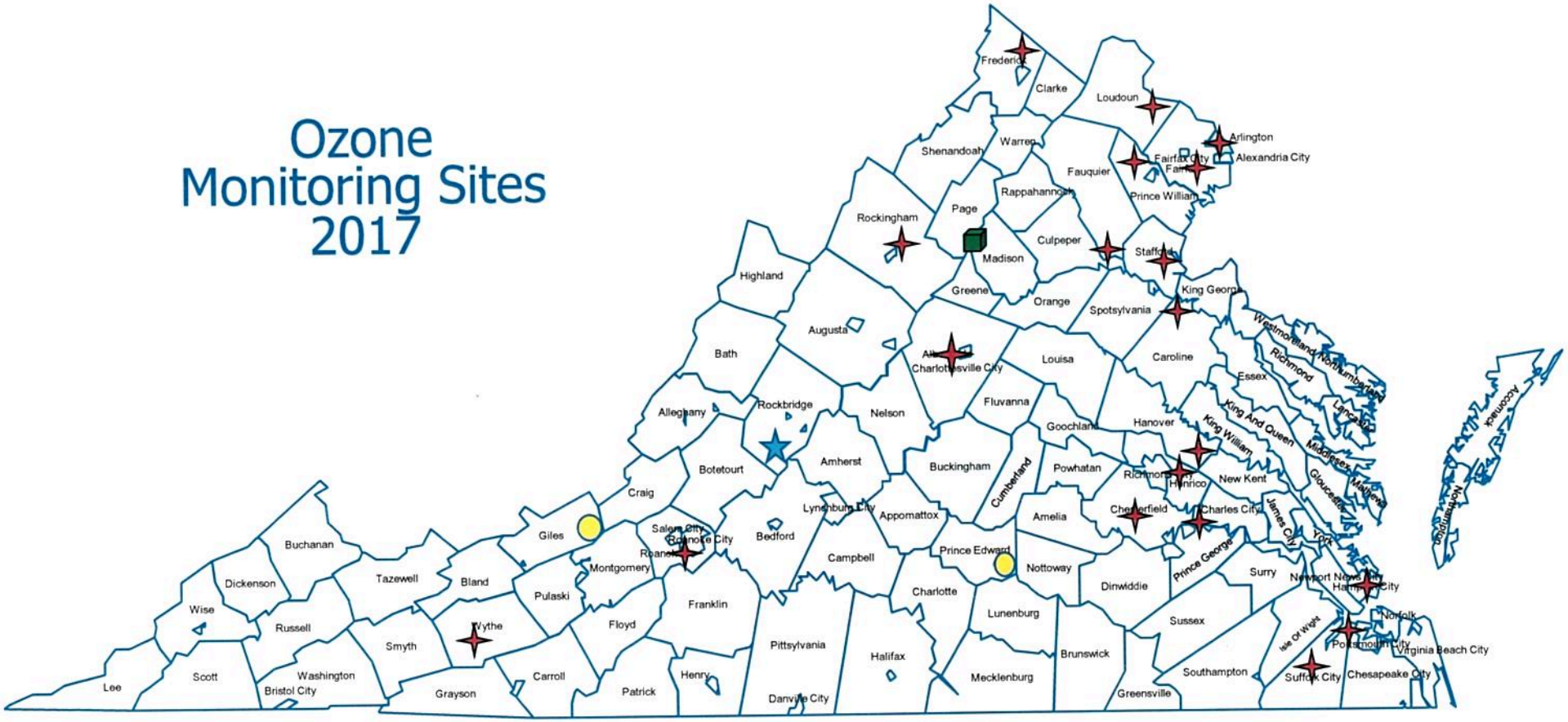
SOUTHWEST REGIONAL OFFICE
Director – Jeffery Hurst
355 Deadmore St.
P.O. Box 1688
Abingdon, Virginia 24212
(276) 676-4800

PIEDMONT REGIONAL OFFICE
Director – Jeff Steers
4949-A Cox Road
Glen Allen, Virginia 23060
(804) 527-5020

TIDEWATER REGIONAL OFFICE
Director – Craig Nicol
5636 Southern Blvd.
Virginia Beach, Virginia 23462
(757) 518-2000

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Ozone Monitoring Sites 2017



VA Department of Environmental Quality

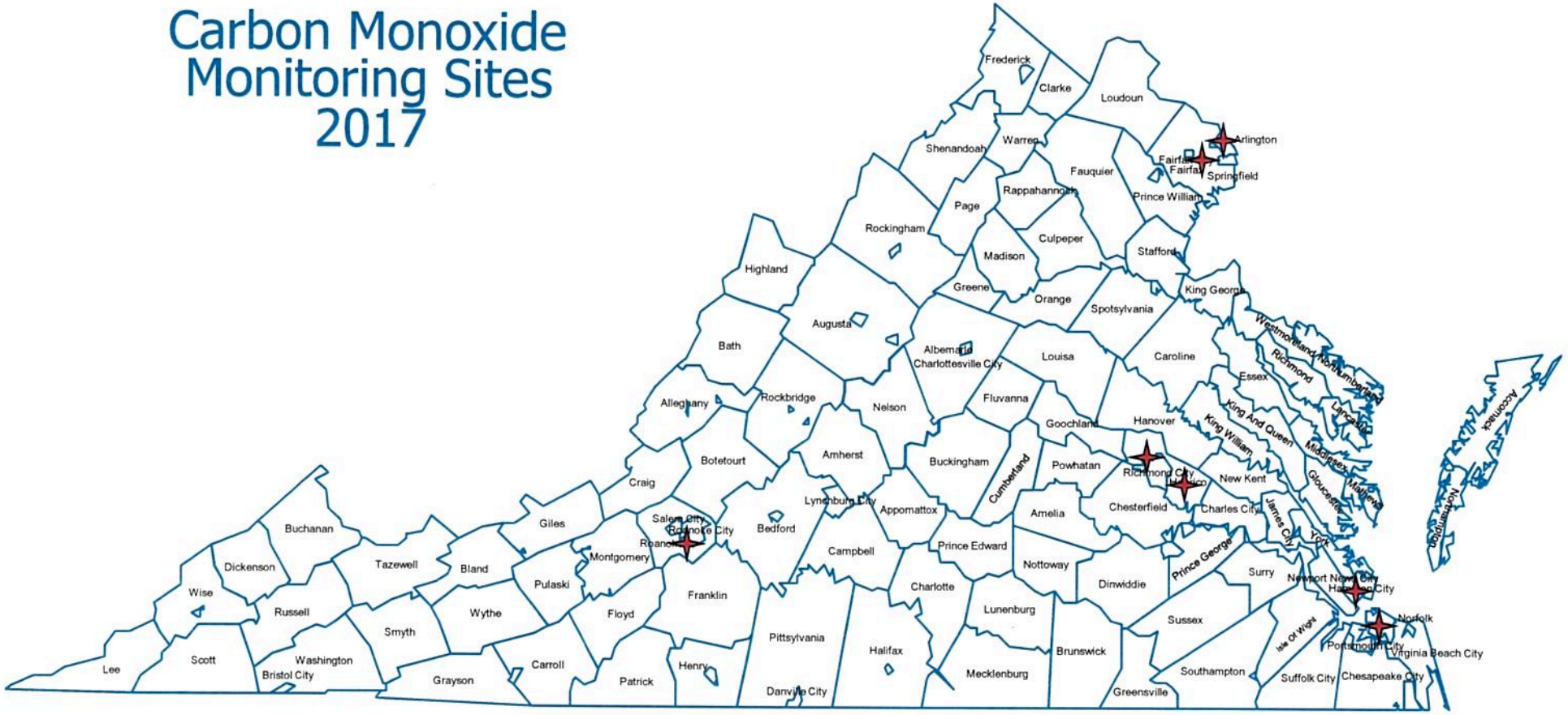
EPA CASTNET sites

National Park Service

U S Forest Service

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

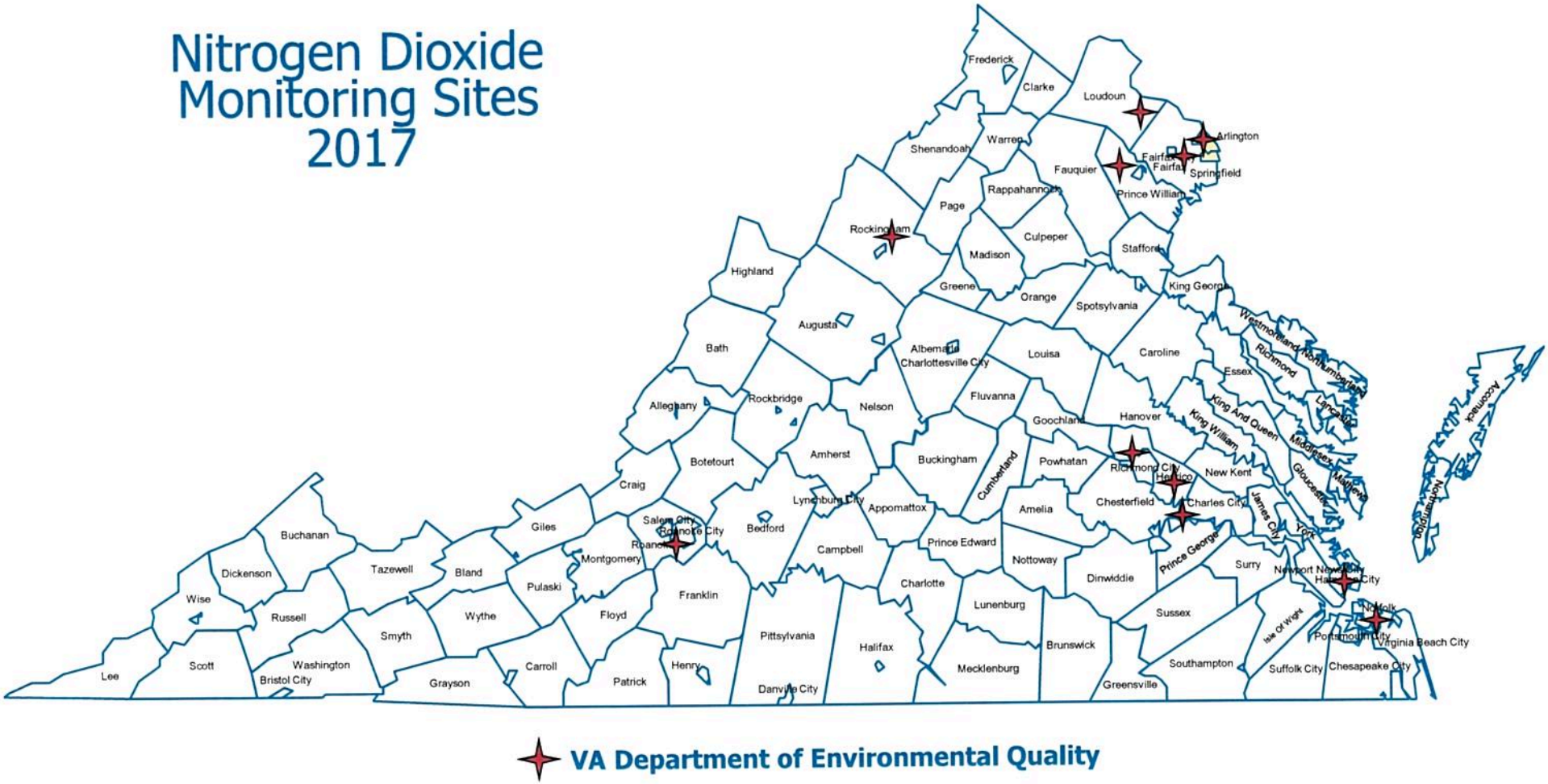
Carbon Monoxide Monitoring Sites 2017



VA Department of Environmental Quality

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

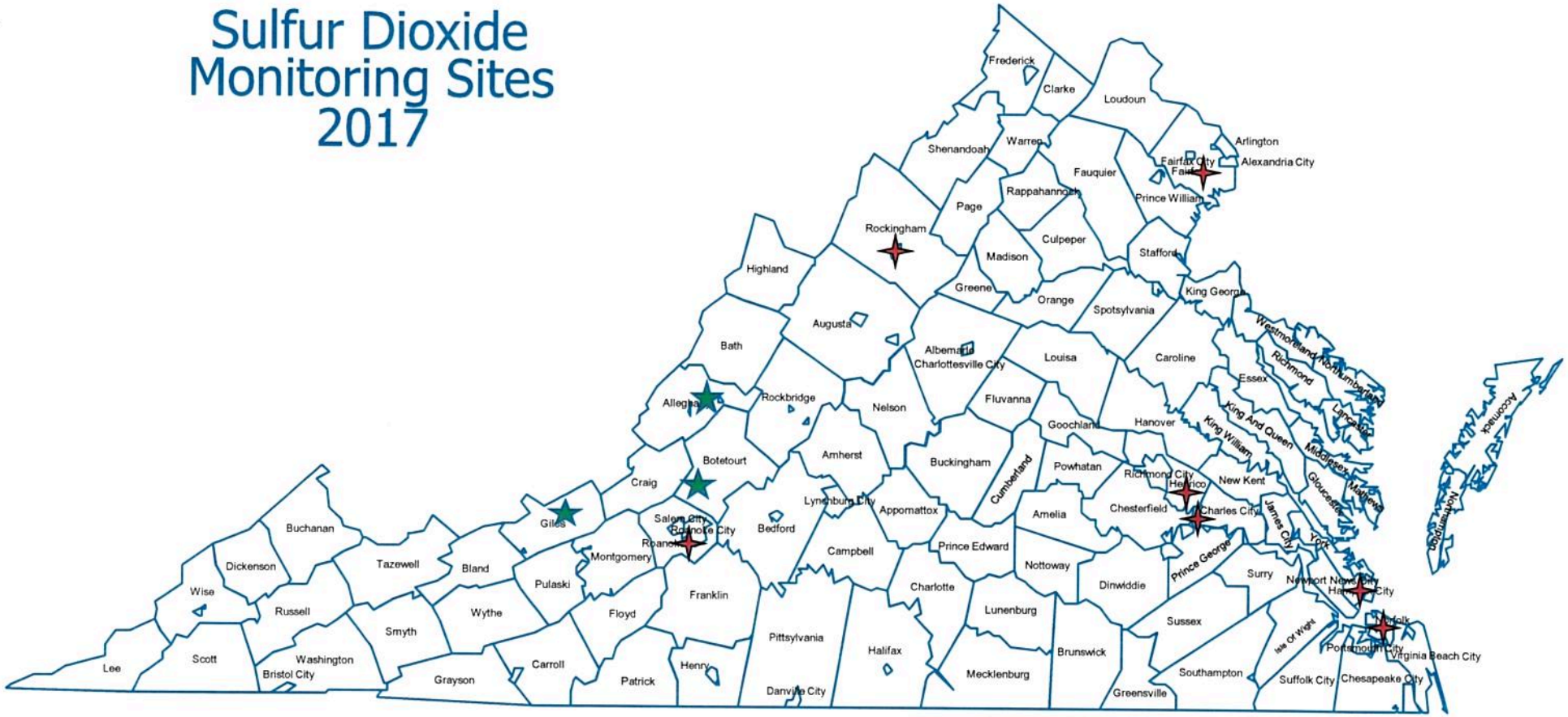
Nitrogen Dioxide Monitoring Sites 2017



VA Department of Environmental Quality

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Sulfur Dioxide Monitoring Sites 2017



VA Department of Environmental Quality **Industrial Sites**

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

PM2.5 Monitoring Sites

2017

FRM/FEM Monitors

FRM Mass and TEOM Samplers

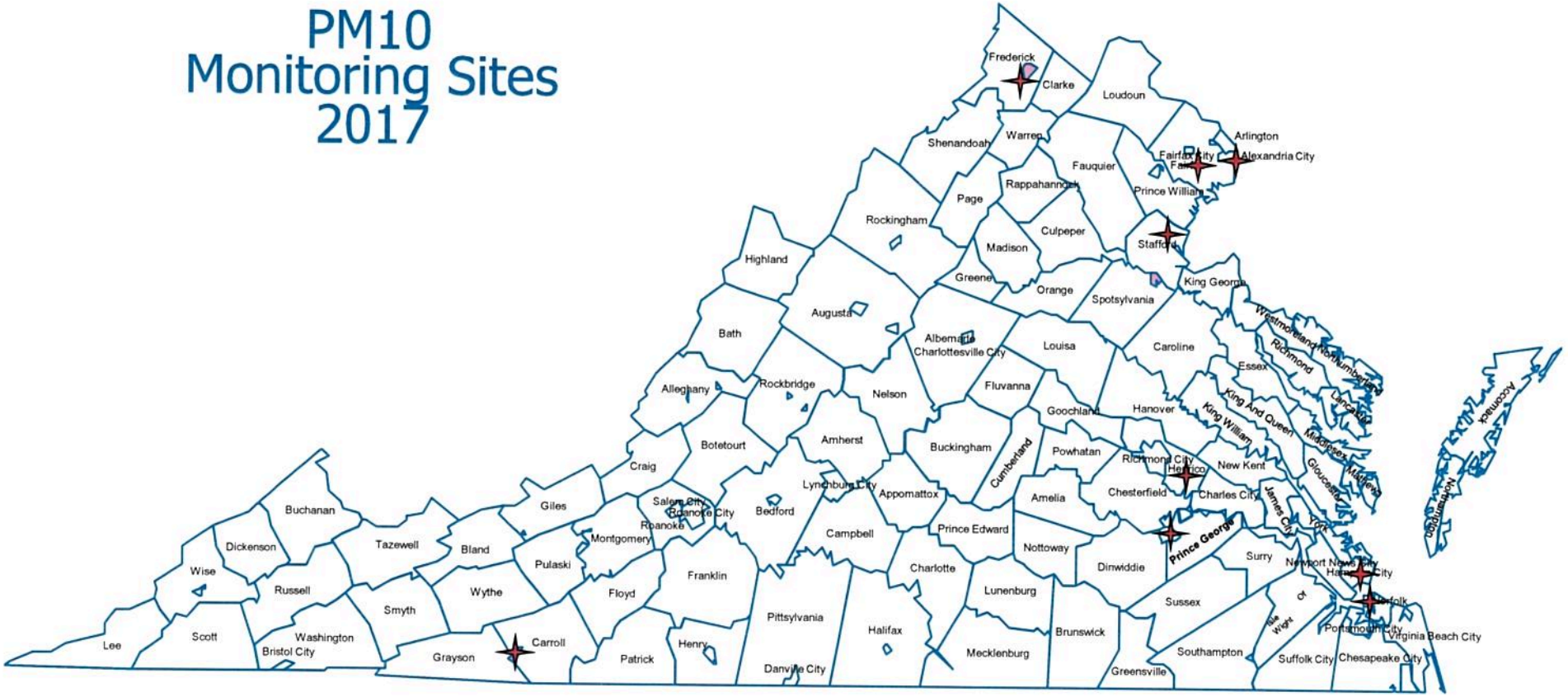
IMPROVE sampler

FRM Mass, Speciation, TEOM, Carbon

TEOM & IMPROVE sampler, Big Meadows, NPS

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

PM10 Monitoring Sites 2017



VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY